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CHARLES EDWARD ISAACS

A FORGOTTEN AMERICAN KIDNEY PHYSIOLOGIST*

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MINNEAPOLIS, MINN.

IN a recent article on "The Beginnings of Amercan Physiology" by Walter J. Meek,[1] attention is called to two early American publications entitled "Researches Into the Structure and Physiology of the Kidney" and "On the Functions of the Malpighian Bodies of the kidney"† by Charles Edward Isaacs. His experiments, and the conclusions which he drew from them, are so important that they should entitle him to rank with Bowman and Ludwig, and to supplant Heidenhain in the great triumvirate of kidney physiologists. Isaacs' contributions may be summed up as follows: first, he advanced a much more refined anatomical technique by which he confirmed Bowman in most of his essential findings, and correctly disagreed with him on other important points, such as the presence of a membrane directly upon the tuft of capillaries in the Malphigian bodies; and second, he introduced the study of secretion of dyes by the kidney, almost twenty years before Heidenhain, from which he drew the important conclusion that the Malpighian body was the most important secretory part of the kidney.

Charles Edward Isaacs[2,3] was born at Bedford, Westchester County, New

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† These two papers were published in the *Transactions of the New York Academy of Medicine*, 1: 377; 1857. Abstracts of these articles have been found in the *New York Journal of Medicine*, S. 3, 1: 1856, and in Schmidt's *Jahrbücher*, 96: 155, 1857, and 104: 3, 1859.

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York, June 24, 1811. His father was a merchant and farmer. He commenced the study of medicine with a relative, Dr. Belcher, in New York City. He attended his first classes in the College of Physicians and Surgeons of New York. Later he entered the office of Dr. Graves who subsequently moved to Baltimore, taking Isaacs with him. In 1832, Isaacs graduated in Medicine at the University of Maryland. In the ensuing fifteen years, Dr. Isaacs was, for the most part, an army surgeon. During this period he traveled with the Cherokee Indians through the southern states to their permanent residence west of the Mississippi, and he served in army forts such as on Governor's Island, Fort Kent, Maine, then at Copper Harbor, Lake Superior, during the excitement following the discovery of copper, and finally at Fort Niagara, Youngstown, New York. About 1845 he resigned from the army because of ill health and soon thereafter opened a private school for medical students with Dr. W. H. Van Buren in New York. The next year, after several changes, he accepted the appointment of Demonstrator of Anatomy in the College of Physicians and Surgeons, New York. Some time later he accepted positions as Demonstrator and later, Adjunct Professor of Anatomy, in the Medical College of the University of the City of New York. It was during the time that he held the appointment of Demonstrator of Anatomy in the University Medical College that his contributions upon the kidney were completed and presented.

Dr. Isaacs was also a widely known practitioner. The medical journals of his day contain numerous case reports coming from him which were mainly surgical in character. From them we learn that he was on the staffs of a number of New York Hospitals such as King's County, Blackwell's Island, Brooklyn City, and the Seamen's retreat.

In addition, he was an active member of his County Medical Society (King's) and took an active part in its meetings. He was one of the founders of the New York Pathological Society; and in this Society he held successively the offices of President and Vice-President. And lastly, he was an active member of the New York Academy of Medicine, and at one time was one of its vice-presidents. It was said by his contemporary, Dr. Joseph C. Hutchison, professor of Operative Surgery and Surgical Anatomy in the Long Island Medical College, Brooklyn, that no one contributed more to the scientific fame of the New York Academy of Medicine than Dr. Isaacs. His scientific fame rested upon his two kidney publications, reviews of which follow, and upon the report of his study "On the Extent of the Pleura Above the Clavicle."[4] In this publication he described the results obtained in a series of one hundred dissections in which he actually measured the height of the pleura. He presented tables to show the variations in male and female, and he pointed out the differences between the findings in long-necked and short-necked individuals. From his measurements he concluded that in one case out of four the pleura extends above the clavicle, and that this occurs mostly on the right side. Furthermore, he observed that in almost one case out of four, the subclavian artery in its third division rests upon the pleura.

Dr. Isaacs died on June 16, 1860, in Brooklyn. Dating from his trip with the Indians through the South, he had been a sufferer from malaria. This seemed to have been a handicap to him, although had he not been in ill health, he might never have resigned his army commission and have accepted a position in a medical school, where his important researches were completed. His death was due to pleuropneumonia superimposed upon Bright's disease and the long-standing malarial infection. His death then was probably directly due to diseases of the structures, pleurae and kidneys, upon which he made his important contributions.

Isaacs' first paper was read before the New York Academy of Medicine on March 5, 1856, and was the result of three or four years of work. Naturally he had the advantage of knowing Bowman's work,[5] and the intense controversy that was being waged around it. Not having any particular desire, as he says, to support one side more than another, but to get at the truth, he set about first repeating Bowman's experiments just as he had described them. He found, as had many other investigators, that Bowman's findings were difficult to obtain. However, instead of then denying them, as others had done, he proceeded to work out a technique that would give constant results regardless of what they were. Having succeeded in this, he then tried it out on kidneys from the following animals: frog, turtle, snake, alligator, fish, bird, mouse, rat, squirrel, cat, dog, raccoon, rabbit, hog, sheep, deer, elk, moose, ox, horse, black bear, rhinoceros, monkey, and man. How many other investigators have made use of such an extensive and representative series of organs?

Throughout his papers, Isaacs very carefully described the steps of his procedures. He stressed using fresh tissue, and, wherever posible, kidneys that had been removed from the body immediately after death. When delay occurred, he noted that the cell structure changed. When he placed small pieces of kidney tissue in water, he observed again that the cell structure changed, so he substituted a solution of albumen in water or urine as his working medium. In these solutions he found that the cells did not swell, lose their shape and finally rupture, but retained what he believed to be their normal contour. It can therefore be seen that he had a good practical knowledge of the rôle of osmosis in the cell, over fifty years before Martin Fischer[6] made his contribution to this field.

For studying the continuity of various structures, he made use of certain coagulating methods. This would tend to hold these structures more firmly together, such as Bowman's capsule with its inner tuft and its connection to the tubule. To produce this coagulation or even semi-coagulation, small pieces of kidney tissue or scrapings of kidney tissue were heated in an albumen solution to which had been added a few drops of chloroform, sulphuric acid or nitric acid. If too much sulphuric acid had been added, Isaacs observed that all of the minute vessels and capillaries would be dissolved, leaving only the Malpighian tuft, the capsule and tubule. Again, he found that nitric acid would dissolve the cells of Bowman's capsule leaving the tuft and its membrane little affected. He was of the opinion that these differences in solubilities indicated differences in the structure of these membranes and that this latter indicated differences in function. Still another method was used to study the attachments of various structures: small pieces of kidney were suspended in the vapor of alcohol for two or three weeks, then washed and agitated occasionally in water for twenty-four or thirty-six hours. Finally, very small pieces were examined with a microscope. These methods, of course, all resulted in opaque preparations.

For transparent studies he placed small scrapings of the kidney in albumen solution and agitated them for a time, then examined small pieces with the microscope. This agitation process, Isaacs says, loosened and removed the matrix, leaving the important structures with their normal connections.

To prepare the membrane or groups of cells on the capillaries of the Malpighian body, Isaacs sometimes used the method of dissolving the outer membrane or capsule of Bowman as described above. But in addition, he also obtained satisfactory preparations by injecting fluid up into the ureter under pressure and bursting the capsule, and by simply dissecting off the capsule with a needle.

The anastomoses and connections of the smaller arteries and veins were best demonstrated, as Bowman had shown, by the injection of various substances by way of the renal artery and vein. In this work Isaacs used various colored substances such as vermillion and chrome yellow. In addition he mentions a rather ingenious procedure of injecting white lead finely ground in oil and well agitated with sulphuric ether.

Does not the description of his methods of procedure then tend to indicate that Dr. Isaacs possessed a technical knowledge far ahead of his time? His methods, though extremely simple, required unlimited patience and perseverance. But each step was devised with a fine experimental skill to bring out the various fundamental principles at which he aimed. Behind many of his procedures we can now see good scientific reasons for their success.

In his two publications are to be found forty-seven plates. With two exceptions, all of these were reproductions made from structures observed with the microscope. He mentions that they were drawn by medical artists and reproduced as accurately as possible. Here, then, is one of the very early articles, of the modern era, on kidney anatomy in which each point considered is illustrated as accurately as could be drawn from the microscopic field. Some of his plates are of structures that have been rarely seen, and many of the plates cannot be duplicated in any earlier work. If these drawings are compared with those found in similar publications of his time[5,7,8,9,11] it can be readily seen that with one exception,[8] they are far superior in amount of detail presented and exactness of reproduction. From these drawings woodcuts were made by a well-known engraver of New York. Photographs of some of the plates are reproduced in this paper.

Turning now to the results obtained by his experimental procedure, we find that Isaacs made a detailed study of all of the structures to be found in the kidney. He begins with a description of the tubular epithelium. Many authorities, including Bowman, held that the cells were spheroidal or of a "glandular" type. But when small pieces of fresh kidney were prepared as above, Isaacs found the cells to be not rounded, but mostly polygonal, that is, of a pavement or tessellated variety. The cytoplasm was granular and they contained nuclei also granular and generally these latter contained one or two nucleoli. This view is still held today.

The question of cilia upon the tubular cells was next studied. Bowman had satisfactorily demonstrated them in the kidneys of frogs, fishes, snakes, turtles, etc. But their presence in the mammal was greatly contested. Only one other authority, Hassal,[7] had observed ciliary motion in a mammalian kidney. Isaacs, however, demonstrated this motion on the kidney cells of the ordinary laboratory animals and on the kidney cells of such animals as the sheep and ox. In extremely fresh preparations, Isaacs observed currents of liquid flow through the tubules teased away from a larger mass of tissue. At times he saw cells separate themselves from the basement membrane and be propelled on down through the tubular lumen. Some of these free cells then took on a rotary motion in the liquid containing them. In only one case did he actually see cilia and that was on a tubular cell from the kidney of an ox. In human kidneys he observed no evidence of ciliary motion, due, he thought, to the difficulty in obtaining a specimen sufficiently soon after death.

Concerning the course of blood through the kidney, Isaacs takes issue with Bowman. His Plate 3 (Fig. 1) gives his reason.

This shows an arteriole branching, one branch passing into a Malpighian coil and another branch entering the venous plexus around the tubule. This is the only reference in his paper to this finding, so undoubtedly he did not find a great number of these. As a result of this observation, he concluded that "the venous plexus contains a certain amount of arterial blood derived from those minute twigs of the renal artery in the cortical portion of the kidney which do not enter the Malpighian capsules." He tended to give the impression, however, that the amount of blood that follows this course is not very large.

His Plate 5 (Fig. 1) shows the characteristic venous network between the larger branches of the renal veins. The majority of the clear spaces are occupied by tubules, although some of the larger ones contained Malpighian bodies, for two are pictured in the larger right-hand division. This drawing was obtained from a field of a sheep's kidney which had been previously injected. It was rendered transparent with chloroform for the drawing.

Isaacs also recognized the long straight tubules of the pyramidal portion of the kidney among which were to be found numerous veins. It can thus be seen that Isaacs was aware of the long branches of the loops of Henle,[8] but, like Bowman, did not discover their connections together and to the proximal and distal convolutions. He was, however, aware of the connections between the proximal convolutions and the straight tubule as is evidenced from his Plate 9 (Fig. 1).

On the other hand, the connection between the proximal convoluted tubule and the Malpighian body was one of which Isaacs was well aware. The demonstration of this connection was one of Bowman's most important contributions to Anatomy, but it

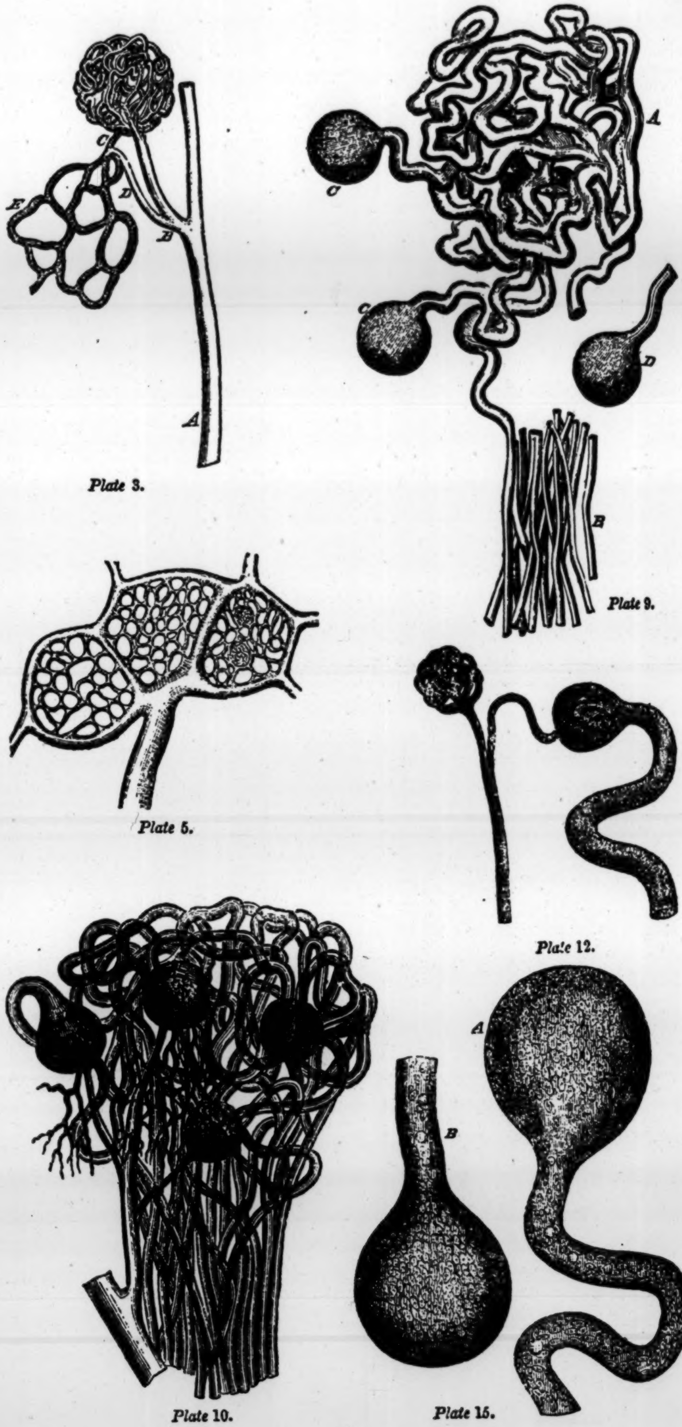

Plate 3.

Plate 9.

Plate 5.

Plate 12.

Plate 10.

Plate 15.

FIG. I.

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remained for Isaacs to show more of the detailed anatomy and to present the first authentic and exact reproductions of this connection. His Plates 9 and 10 (Fig. 1) both show this connection beautifully.

His Plate 10 was obtained from a sheep's kidney that had been given an intravascular white lead injection. Small pieces of kidney tissue were then boiled in very dilute chloroform and sections were made with a Valentin's knife. In this reproduction from a microscopic field we see an arteriole dividing into branches, which become afferent glomerular arteries. The efferent vessels are also shown breaking up into venous plexuses. Furthermore, we see Bowman's capsule continuous with the basement membrane of the proximal convoluted tubule, which in turn passes into a straight tubule. In what other publication can an exact reproduction of so much anatomical detail of this type be found? Would not this picture alone entitle Dr. Isaacs to a high place in kidney anatomy?

From another kidney which had been injected with chrome yellow and sulphuric ether, his Plate 12 (Fig. 1) was obtained. In this case small scrapings of kidney tissue were gently agitated in a testtube of water and then small pieces were observed with the microscope. This plate shows a small arteriole dividing into two branches, both going to Malpighian bodies. In one case we see the bare tuft and in the other, Bowman's capsule around the tuft which is continuous with the basement membrane of the tubule. The neck of this shows the constriction first described by Bowman and which is hereby confirmed and graphically illustrated by Isaacs.

Having satisfactorily demonstrated and illustrated, for the first time, the connection that exists between the tubule and the Malpighian body, Isaacs next proceeded to demonstrate the structure of this latter. The cellular structure of Bowman's capsule is illustrated in his publication from the kidneys of the sheep, cat, ox, gray squirrel, domestic fowl, snake and haddock.

His Plate 15 (Fig. 1) shows the characteristic findings from Bowman's capsule in the cat's kidney. It was Bowman who first described these cells and showed that they were continuous with the epithelium of the tubule.

Inside of the capsule is the tuft of capillaries which Bowman described as hanging in this tiny sac entirely bare. On this point, also, Isaacs takes issue with Bowman, for he describes a covering of nucleated cells. Illustrations of these cells are shown from the kidneys of the black bear, raccoon, cat and man. The steps used in demonstrating this structure were as follows: the artery was injected with chrome yellow, the capsules were burst by ureteral injections, or the capsule was scratched off after the preparation was placed under the microscope. It was in this connection that Isaacs also discovered that dilute nitric acid would dissolve Bowman's capsule, leaving the nucleated cells around the tuft and the tuft itself relatively unchanged.

Isaac's Plate 25 (Fig. 2) shows these nucleated cells upon the capillary tuft obtained from the Malpighian body in a racoon's kidney. At the top of the plate can be seen portions of the ruptured Bowman's capsule. The nucleated cells upon the tuft can be seen to be larger than the nucleated

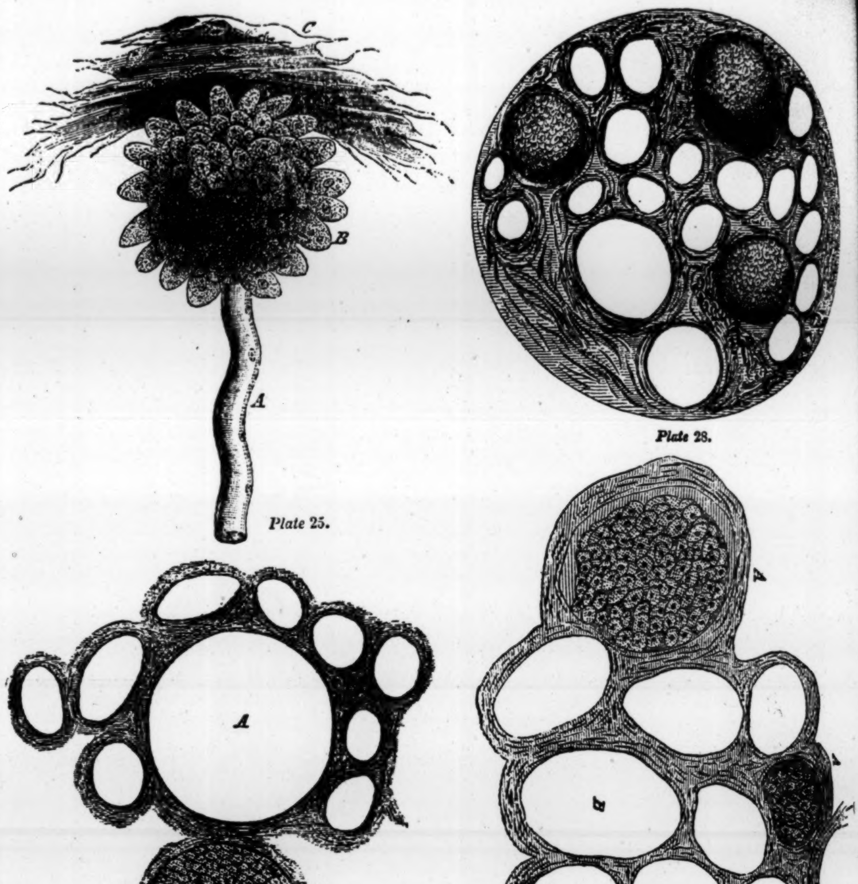

Plate 25.

Plate 28.

Plate 38.

Plate 42.

Plate 43.

Plate 44.

FIG. 2.

cells of Bowman's capsule. This is in accord with what we believe today.

His Plate 42 (Fig. 2) also shows the cells upon a tuft taken from a healthy human kidney. So here, for the first time, are described and illustrated for mammals and man the nucleated cells which exist on the tuft of vessels in the Malpighian body.

According to Isaacs, the first description of these nucleated cells was given by Gerlach[9] in 1845. In Gerlach's publication are to be found descriptions and illustrations of this structure from the frog's kidney. Bidder,[10] in the same year, also seemed to have been aware of them, for, according to Isaacs, he described the tuft of capillaries as being pushed into the expanded end of a uriniferous tube, "the relation of the two being similar to that of the head within a double nightcap." He obtained his descriptions from frogs and tritons. Just a week before Isaacs read his paper, he found a publication by Busch[11] in which was described and illustrated this covering of nucleated cells over the tuft from the kidney of the snake.

Another observation obtained from human kidneys by Isaacs is perhaps also worth mentioning. These kidneys were obtained from a man who had died from alcoholic cirrhosis of the liver. He made very thin sections of the kidney and upon examination found what he believed to be particles of bile pigment within the tubules, a deep yellow stain in some of the cells of the tubules, and a slight yellow or brassy color in the Malpighian bodies. He applied Pettenkoffer's test for bile to the section under the microscope and obtained the play of colors from the Malpighian bodies and colored contents of the tubules characteristic of bile. Portions of the kidney steeped in water colored it yellow, and this fluid again gave the play of colors with the above test characteristic of bile. He concluded that bile was being excreted by the kidneys; especially so, because the individual had been deeply jaundiced for some time previous to death.

The concluding anatomical study of Isaacs' paper had to do with the matrix of the kidney. The fibrous matrix was first described, as Isaacs says, by Goodsir[12] in 1842. But this structure again was disputed and even denied by many authorities. Following the directions given by others for exhibiting this tissue, Isaacs says he had never satisfactorily succeeded. But with his own method of making very thin sections with a Valentin's knife and then agitating them in water for two or three hours, he always succeeded. Sections prepared as above showed a honeycomb or network arrangement. The cells of the honeycomb were the openings which in the normal state supported the tubules, blood vessels and Malpighian bodies. These were all washed out in the process of preparation.

His Plate 28 (Fig. 2) shows the fibrous matrix of the kidney of the rat. The smaller openings are for the tubules, and the larger ones for Malpighian bodies. Three of the latter can be seen. Similar drawings are shown for this structure in the kidneys of the dog, grey rabbit, raccoon, grey squirrel, hog, sheep, ox, horse, elk, moose, black bear, and man.

Isaacs' Plate No. 36 (Fig. 2) is from the kidney of the ox, and his Plate 42 (Fig. 2) from a healthy human kidney. Both of these plates show the matrix, but in addition, Plate 36 shows the cellular structure of Bowman's capsule, and Plate 42 shows the nucleated cells situated on the tuft of capillaries within the capsule.

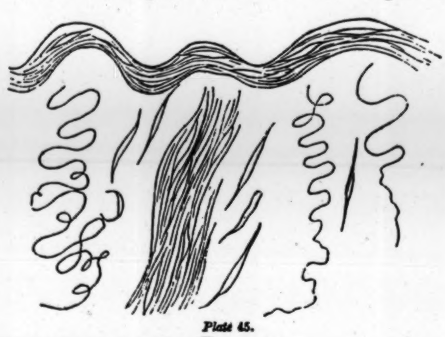

Plate 45.
FIG. 3.

His Plate 43 (Fig. 2) is from the kidney of the sheep. The large clear space is that occupied by a Malpighian body, and the smaller spaces by tubules. At *A* and *B* can be seen sections of uriniferous tubules. In the fibrous rings around these spaces can be seen dark round points. These are cross sections of capillaries which appear thus from an injection of vermillion by means of the renal artery before the sections were made.

To study its composition, Isaacs made use of various acids such as acetic, nitric, muriatic, phosphoric and sulphuric. By means of applications of these acids he was able to study its solubilities and characteristic appearances and to compare the results with those obtained by similar applications to known white fibrous and yellow elastic tissue. He concluded from these studies that the kidney matrix was composed of white fibrous tissue.

His Plate 44 (Fig. 2) shows the fibrous matrix from the healthy human kidney treated with acetic acid. Plate 45 (Fig. 3) shows the alveolar tissue from around the renal artery of the ox acted upon by dilute nitric acid. White fibrous tissue is shown in the center, while around this mass are shown yellow elastic fibers which as the author says, "are curled like the tendrils of a grapevine."

From his numerous examinations of the matrices of kidneys, Isaacs concluded that its function is to serve as a skeleton or framework. In pathological conditions he pointed out that this matrix becomes diminished in size and indurated, and that by irregular contractions it may thus constrict the tubes and Malpighian bodies. In this regard, he ascribes the absence of yellow elastic tissue in the kidney to its greater contractility, because it would increase the danger of constriction of the tubes and Malpighian bodies.

Dr. Isaacs' second paper was read before the New York Academy of Medicine on February 4, 1857. Its title was "On the Functions of the Malpighian Bodies of the Kidney." The experiments which were here reported were performed in an attempt to confirm his ideas of he rôle played by the Malpighian bodies in the secretion of urine. Briefly, they consisted of the injection of various coloring matters, as he called them, into animals, after which secretion by the kidneys was studied. Thus we have the beginning of one of the most important experimental and diagnostic procedures of kidney physiology, namely, the secretion of dyes to study and determine kidney function.

Isaacs began this all-important work by studying the kidneys of animals which had received injections of a suspension of finely pulverized indigo in water. The experimental procedure was to inject these mixtures into the stomach and intestines of animals after loops had been made to prevent the downward escape of the material. The ureters were tied in the animals and following this operative procedure the animals were allowed to remain unmolested until they died. This occurred, as a rule, within a day or two, and Isaacs thought it was due to retention of urea. For an anesthetic, Isaacs used sulphuric ether. This is probably the first time that this anesthetic, now almost ninety years old, was used as such in an experimental kidney procedure.

In seven animals, cats and dogs, so treated, five showed unmistakable evidence of indigo in the Malpighian bodies and tubules. Some were of a light shade of blue-green, others were deep blue, and still others were almost black. In some experiments the dye within the tubules was confined to those in the pyramidal portion of the kidney. In one animal one kidney had been removed at the time of the indigo injection. The remaining kidney in this case showed a much deeper coloration of the Malpighian bodies and tubules. In some cases the coloring matters were to be seen in the centers of the capsules with a clear area between the tuft and the capsule. This was interpreted by Isaacs to mean that the dye had not as yet been excreted, for in other cases the tuft was pale in color, while the area outside of the tuft, but inside of Bowman's capsule, presented a much deeper coloration. The urines in the upper portions of some of the ligated ureters and pelves of the kidneys were of a slight blue color.

These pictures, described by Isaacs, might in one sense be called the first experimental indication of what is called at the present time intermittency of glomerular blood flow. This was first described from living kidneys by A. N. Richards[13] in 1922, but existed more or less clearly in the mind of Claude Bernard[14] in 1858, for he puts forth as his belief that the nerve supply of the kidney functions to decrease the blood flow through the functionally important capillaries of the kidney during rest. The fact that some of the Malpighian bodies showed deep stain, others slight coloration, and still others no dye, can only be explained by the fact that all of the Malpighian bodies, or glomeruli as they are called at the present time, are not functionally active at the same time.

In the remaining two of the seven animals he reported failures. Into these two he injected a "deoxidized indigo prepared according to the process of the dyers, with sulfate of iron and lime water. By this process the indigo becomes very soluble and of a light yellow color, absorbing oxygen and turning blue on exposure to the air." In these cases he found no trace of the dye in the kidneys, and he was unable to offer any explanation for this failure.

In another animal Isaacs made two separate injections, one of potassium ferrocyanide, and one of ferrous sulphate. When examined, the kidneys of this animal showed blue deposits, as in the previous experiments, in the Malpighian bodies and tubules.

Following this, the author describes entirely similar types of pictures produced by the injections, as before, of madder, solution of Brazil wood, cochineal, carmine, log wood, Spanish saffron and Persian berries. In all cases the Malpighian bodies and tubules gave positive evidence for the presence of the dye, but in none of these kidneys was any evidence forthcoming, says the author, for the presence of any one of these dyes in the venous plexuses of the kidney.

He next describes an experiment in a cat which was repeated five times, all resulting in the same findings. Using the same procedures as before, he injected suspensions of animal charcoal or lamp-black. At varying intervals of time the animals were killed. Upon examining the kidneys he found that the Malpighian bodies and tubules displayed varying shades of blackness. As additional proof that this coloration was due to the charcoal, he pointed out that he was also able to find the carbon particles in the hepatic cells and the cells of the spleen.

In two more animals, by ligating the common bile duct and then allowing the animals to live for several days, he hoped to identify bile pigments in the kidney. The kidneys from both animals were yellowish and the Malpighian bodies in both appeared a yellowish red. But only from the kidneys of one animal was he able to get satisfactory tests for bile salts, the others being entirely negative. The bile from this same animal, whose kidneys gave a negative Pettenkoffer test, also failed to give the characteristic play of colors in this bile salts test.

Whenever possible, Isaacs made use of clinical material for observations that might throw light on the function of the kidney. He examined the kidneys from a child of three months to ascertain the presence, if possible, of uric acid in the Malpighian bodies. Whereas he was not able to see crystals in the tuft, he did obtain characteristic tests for uric acid from the Malpighian body. In another set of kidneys coming from a patient whose urine showed large amounts of ammonium urate several days before death, he met with the same results. He concluded that more observations were necessary before this question could be settled.

Another extremely interesting series of experiments had to do with so-called stimulating diuretics. Those used by him were potassium nitrate, tincture of cantharides, phosphorus in olive oil, and spirits of turpentine. All of these irritants produced marked congestion of the Malpighian bodies. The individual capillaries were dilated and filled with blood and they were of a dark red or purplish color. Many of the capillaries were ruptured. The venous plexuses around the tubules were also much dilated and congested.

Finally, Dr. Isaacs reports his experiments in which he injected various finely powdered metals such as bismuth, gold, copper and antimony, into the stomach and intestines. Upon examining the kidneys he found visual evidences for the presence of some of these in both the Malpighian bodies and tubules, but when the kidney substance was tested chemically for these elements, all tests failed to substantiate the microscopic evidence, so he concluded that their absorption by the intestinal tract and excretion by the kidney was not as yet demonstrated.

Another finding is reported to show the importance of the Malpighian bodies. Due to illness, Isaacs arranged with his friend, Dr. J. S. Gouley, to carry out the experiments for him. These consisted in ligaturing the abdominal aorta below the origins of the renal arteries. Following this procedure, if the kidneys were removed and sectioned, they observed a picture similar to that produced by an arterial injection of the kidney, with the exception that the Malpighian bodies were enormously distended, so much so that they could be perceived with the naked eye.

This concludes the summary of the experimental work of Dr. Isaacs from which he deduced his theory of kidney function. Here was an investigator who, for the first time, illustrated all of the important anatomical points of the kidney parenchyma (except the continuity of the loop of Henle) by accurate drawings of structures observed under the microscope. These drawings covered observations on a large number of animals, beginning with forms such as the frog and snake, and then passing through the scale of mammals up to and including man. Does not this alone speak for tremendous thoroughness on the part of this investigator? But in addition, he departed from his usual sphere of activity and resorted to experimental procedures on animals. In this field, although an anatomist by training, he was probably the first American to study experimental kidney physiology.

Judging from the reports of his experiments and the discussions following them, he appeared to have formulated his theory first from his anatomical findings. He emphasized the covering of nucleated cells on the tuft of capillaries in the Malpighian body. Comparing their structure to capillaries found elsewhere in the body, such as those which form the cerebrospinal fluid and which are of a simple structure, he concluded that the capillaries in the Malpighian body were far too complex to simply remove water from the blood. Therefore he put forth as his opinion that all of the constituents of the urine were removed from the blood in these structures. The exact process by which this occurred he thought to be due to "secretion" by the nucleated cells on the capillaries, and not by the process of "simple exosmosis." To substantiate further this theory, he brought out the finding of Bowman that all of the blood of the renal artery with the exception of a small amount going to the capsule and a few other structures, flows through the Malpighian bodies. Isaacs, however, limited this flow of blood through the Malpighian bodies, to "nearly all" as a result of his finding illustrated in his Plate 3 (Fig. 1). Because of this important fact that the Malpighian bodies receive so much blood before it flows to the other structures in the kidney, and because the capillaries in these structures are so small, he felt that the blood was placed in a most advantageous position for the escape of the urinary constituents.

In discussing his ideas as opposed to those of Bowman, Isaacs mentioned the following facts: that so many of the urinary constituents have been found already formed in the blood; that various foreign substances like inorganic salts, alkaloids, colors such as indigo, madder, Indian fig and alcohol, after having been introduced into the body, have been found in the urine; that he himself had taken potassium ferrocyanide by mouth and had later demonstrated its presence in the urine by the addition of solutions of iron salts; and that after having taken small quantities of benzoic acid by mouth he found "on microscopic examination of the urine that it had been changed and separated from the kidney under the form of hippuric acid." Finally, he pointed out that even Bowman admitted that diuretics must act upon the Malpighian body, for he says:

> Diuretics appear to act specially upon the Malpighian body, and various foreign substances, particularly salts, which when introduced into the blood, pass off by the urine with great freedom, and exude, in all probability, through this *bare* system of capillaries. The structure of the Malpighian body indicates this; the escape also of certain morbid products, occasionally found in the urine, seems to be from the Malpighian tufts. I allude especially to sugar, albumen, and the red particles of the blood; the two first of which would transude, while the last would escape only by rupture of vessels.

In answer to this quotation from Bowman which appears in Isaacs' first paper, he replied:

> It is then conceded, and we have every reason to believe, that these foreign substances do actually pass through the renal artery, and consequently through the Malpighian tuft or coil; and if this tuft *can* separate all the various substances above enumerated as having been found in the urine, and especially the various salts and urea, are we not justified in believing that in the performance of its normal function it does something more than merely separate the water from the blood?

Does this not display a remarkable logic on the part of Isaacs in interpreting his findings and formulating a theory of renal function? At least one modern author, White,[15] is of the opinion that the glomerulus does something more than act as a filter.

It might be worth mentioning at this point that although Isaacs' theory was somewhat similar to that of Ludwig,[16] in that they both were of the opinion that the Malpighian bodies were the chief structures involved in the separation of the urinary constituents, he was apparently not aware of Ludwig's publications. Isaacs made no mention of Ludwig, but on the other hand, he indicated a wide knowledge of the literature of his subject from an anatomical point of view.

Additional support for this theory, Isaacs believed, was obtained from the study of human kidneys from a patient who had died with marked jaundice, and from an infant which had died probably associated with a very large uric-acid secretion. The finding of bile salts and uric acid in the Malpighian bodies, although not absolutely confirmed, indicated, according to Isaacs, that these substances were being removed from the blood by these structures.

The final and most important support for his theory Isaacs obtained from his experimental work on animals. The action of irritant diuretics and the ligation of the aorta below the origin of the renal arteries, indicated to the author the extreme importance of the Malpighian bodies and their circulation. In a note at the end of his two papers he mentioned that the congestion in the capillaries of the Malpighian bodies observed above, was similar to that observed in kidneys examined at autopsy from patients who had died from suppression of urine. These experimental findings taken in conjunction with pathological pictures and clinical procedures in such cases of avoiding these irritant diuretics and instituting measures to deplete the kidney circulation, were all in complete harmony with his views.

The most complete support for the rôle of Malpighian bodies in the elimination of the urinary constituents was obtained from his descriptions of the kidneys which were engaged in secreting colored substances. The presence of the various dyes in the Malpighian bodies was concluded by Isaacs to mean that these structures were actually engaged in removing them from the blood. To Heidenhain[17] has gone the credit for introducing dye experiments in the study of the kidney. Isaacs, however, employed this procedure seventeen years before Heidenhain, and should therefore now assume his proper share of the glory associated with this technique. In the light of modern experiments which are tending to show more and more the importance of the glomerulus in dye excretion, we cannot but marvel at Isaacs' conclusions which were soundly drawn from his delicate and carefully executed experiments.

Thus ends the account of the work of a forgotten American kidney physiologist. He lived and worked at a time when American men of medical science were just beginning to make a name for themselves. The journals in which their researches were published were probably of a very limited circulation. Moreover, they were not, as a rule, given over to publications of pure research, but were constituted largely by case reports. Fortunately, some of the journals found their way into the hands of abstractors and at least in Schmidt's *Jahrbücher* are to be found abstracts and references to the original. Dr. Isaacs made important contributions to the anatomy of the kidney. He went a step further and began experimental kidney function studies with dyes. Therefore, is it not just that the name of this American be added to those of his two contemporaries, Bowman and Ludwig, to compose the great triumvirate in kidney physiology?

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DATE OF GALEN'S BIRTH

By JOSEPH WALSH, M. D.

PHILADELPHIA

COMPARING Galen's references to events in his life with well-known historical occurrences, and with the time of the equinox, he was born in Pergamum, Asia Minor, in September, 130 A.D.

MONTH OF BIRTH. In an important huge work on drugs (13: 599)[1] he states that he was appointed physician to the gladiators in Pergamum just as he had touched twenty-nine, and that the Pontifex Maximus (under whose jurisdiction the office came) assumed his duties at the autumnal equinox and appointed him immediately. The autumnal equinox occurs on September 22. His birthday was, therefore, in September, and almost surely between the twentieth and twenty-fourth.

Personally, I believe Galen intended this statement to be taken literally, and that he was born on September twenty-second. At the time natal days were celebrated by everyone and presents were almost obligatory. His friend the Pontifex Maximus knowing it was his anniversary might readily make a point of conferring the honor immediately in order to have the pleasure of extending a birthday gift.

YEAR OF BIRTH 130 A.D. In connection with his first sojourn he tells us he arrived in Rome at the age of thirty-two (18_1: 347), remained three years (19: 15), and left after the conclusion of the Parthian War (14: 648; 622) shortly before the arrival of the Emperor Lucius Verus (14: 649). We learn from general history that the war ended late in 165, and that Lucius arrived in the Capital early in 166.[2] This would indicate that Galen was there from about March, 163 until about March, 166 between the ages of thirty-two and a half and thirty-five and a half.

Just after his discussion with Martianos, following the illness of Eudemus (*cf.* 14: 620 ff. and 19: 15), which took place (14: 614) in the middle of his first winter he states (19: 15) he was in his thirty-fourth year. In other words, in the early part of 164 he was past the age of thirty-three.

This chronology corresponds with other events in his life. He was appointed physician to the gladiators just as he touched twenty-nine (September 159), and was appointed five times in succession, each appointment being, he definitely states (13: 600), for seven months. This would be thirty-five months, bringing his service up to August 162, and he left for Rome between this and the following summer.

It also agrees with his declaration to Eudemus (14: 622) two years before he left Rome "as soon as the revolt (the Parthian War) in my Fatherland has ceased I expect to depart from

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[1] The references in parentheses indicate the volume and page of the Kuhn edition, Galeni Opera Omnia, Leipzig, 1821.

[2] Watson, P. B. Marcus Aurelius Antoninus. N. Y., Harper, 1884, pp. 145ff.

Merivale, C. History of the Romans. N. Y., Appleton, 1875, 7: 457.

Duruy, V. History of Rome. Trans. by M. M. Ripley. Bost., Estes & Lauriat, 1894, 5: Sect. 2, 463.

Rome;" and his absolutely unequivocal statement to Epigenes (14:648) thirteen years afterwards, " as soon as I understood the Parthian War was finished I set out immediately from Rome," indicating in both instances it was the conclusion of the war that determined his departure. It is here he also states unqualifiedly that he left before the arrival of Lucius Verus (14: 649) and that he is speaking of the Parthian War carried on by Vologeses (14: 647).

The war began in 161, and before the end of 162 "Asia Minor lay defenceless with all her wealth before the swift cavalry of the Great King."[3]

Caught in the midst of profound anatomical and physiological research, and forced to abandon it, at least temporarily, Galen took the opportunity of visiting the Capital with the intention of returning on the cessation of the war.

There is only one objection to this chronology. After stating in 179 (14: 648) that he left Rome at the end of the Parthian War, he writes in 197 (19: 16) that he returned to his Fatherland after his first sojourn in Rome, at the age of thirty-seven. If this were early in 166, he would have been born (as Goulin[4] affirms) in September, 128. This apparent inconsistency, however, is easily explained.

Galen eft Rome early in 166 (when he was thirty-five), drove hastily to Brindisi, crossed the Adriatic and then proceeded leisurely through Macedonia and Thrace on foot (12: 172), visited at length Thasos, Lemnos (12: 171), Palestine (11: 690; 14: 8; 12: 116) and Cyprus (14: 7; 12: 116; 214–239)[5] and voyaging around the coast of Asia Minor in a small boat (12: 203) reached Pergamum between September, 167 and September, 168 (when he was thirty-seven). This roundabout trip from Rome to Pergamum, which would require at least six months, and was extended by his leisureliness to a year and a half, was partly in the way of a vacation and partly for purposes of concealment. He also made it an occasion for study of the flora and minerals of the different countries.

His sojourn in Rome represented three years of rather intensive work during which he addressed frequently heckling audiences so inimical that his life was sometimes in danger (14: 623).[6] A vacation was well merited.

In the second place enthusiastic philosopher friends had brought about the offer of an official position Galen was loathe to accept on account of its interference with the research work on which he was intent. To avoid the embarrassment of refusing he left Rome secretly (14:648) and not desirous of reaching his native town too soon where letters could easily overtake him, he passed it by and went on to Palestine, apparently with the idea of visiting his friend Boethus, its new Governor. Eventually returning to Pergamum he took up again his research work until recalled by the

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[3] Duruy, V. *Op. cit.*, p. 460.

[4] Encyclopedie Méthodique Médecine. Paris, 1793, vol. 6.

[5] His trip to Palestine is mentioned in a book (11:690) published in 176. The length of his stay in Palestine and Cyprus is somewhat indicated in my recent translation entitled "Galen visits the Dead Sea and the Copper Mines of Cyprus" (*Bull. Geograph. Soc. Phila.*, 25: No. 3, 1927.

[6] Walsh, J. Galen's discovery and promulgation of the function of the recurrent laryngeal nerve. ANNALS OF MEDICAL HISTORY, 8: 2, 1926; also: Walsh, J. Galen clashes with the medical sects at Rome. *Med. Life*, 35: 9, 1928.

Emperors to Aquileia about November, 168.

He made this remark that he returned from Rome to Pergamum at the age of thirty-seven, in a book written in 197, thirty years after the event. In this book he is describing the order in which his works were written, and tells us of those composed in Rome on this first sojourn, and then of the ones he found in Pergamum on his return from the Capital, which had been written by him many years before as a student.

The second part of this description (19: 16 and 17) reads:

> On returning from Rome to my Fatherland at the age of thirty-seven (literally thirty-seven years from my birth having been passed) I found three books which I had written before I went from Pergamum to Smyrna to study under Pelops . . . I set about my accustomed duties, but shortly after received orders from the Emperors (Marcus Aurelius and Lucius Verus) at Aquileia recalling me. For it was their intention to move into Germany (in connection with another war) at the end of the winter.Forced by necessity I set out . . . Arriving at Aquileia I found the pestilence[7] raging (in the Army Camp) as never before, forcing the emperors to flee to Rome. On the journey Lucius died, and Marcus Aurelius had his body carried to Rome and placed among the gods.

Lucius Verus died at Altinum in January or February, 169. Galen, therefore, must have been sent for in the year 168 and apparently in the Summer or Fall.

If he were sent for shortly after his arrival in Pergamum from Rome direct he would have left the Capital previous to September, 168 (while he was still thirty-seven), and if he spent three years in Rome (19: 15), he would have arrived there before September, 165, when he was thirty-four. This would contradict the statements that he was thirty-two when he arrived in Rome (18$_1$:347), and that he was thirty-three after he had already been in Rome some time (19: 15) and likewise contradict the book (14: 649) written to his intimate friend Epigenes (in 179 A.D.) that he left Rome before the arrival of Lucius Verus from the Parthian Campaign, which we know was early in 166. Taking into consideration his Macedonia, Thrace, Lemnos, Palestine and Cyprus trip sets all these contradictions at rest.

Practical confirmation of the date of the visit to Cyprus is given by his assertion in the work dealing with copper as a drug (12: 227), written about 196, that more or less than thirty years had elapsed since he visited Cyprus.

The most cogent reason for visiting Palestine existed when his Roman friend and inspirer Flavius Boethus was Governor. Boethus was appointed to the Proconsulship and went to Palestine in 165.

For about a year and a half before departure he was not only having Galen treat cases in his own family (14: 635; 645) and enthusiastically talking about him to his rich and influential friends (14: 612), but was encouraging him to write by showing his interest, and at least once, by actually paying the cost of publication (14: 630). On account of numerous discussions on Plato and Hippocrates Galen wrote at the particular request of Boethus (19: 15) a work in six books on their medical and biological doctrines (5: 211–805).

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[7] This epidemic, one of the most serious experienced by the Empire, was brought to Rome and its vicinity by the returning Army of Lucius Verus in 166.

About the time it was finished came the announcement of Boethus' appointment to Palestine and his coming departure. It was evidently also about this time he told (2: 216) Galen that fearing he would forget some of the many things he had learned on anatomy he would like him to write out all they had gone over together, so that he might have it on his journey. Galen joyfully consented and quickly wrote (2: 216) the first book on the "Use of the Parts" and what he calls "a comprehensive anatomy in two books."

Becoming dissatisfied with what he had written, immediately after Boethus' departure, Galen began something much more pretentious. This he finished several months later (I believe in the Fall of 165), and he had the pleasure now of sending to the Governor in his new abode a magnificent treatise, a labor of love, on physiological anatomy "The Use of the Parts" in seventeen books (2: 217). Without Galen definitely so stating I have no doubt that Boethus acknowledged the receipt of this work. Nor is it difficult to imagine that in this acknowledgment the cultured friendly Roman would courteously express the natural wish that they were together again.

Finding himself several months later in a position to visit Palestine Galen took the opportunity only to discover on arriving that Boethus was dead. Galen's own statement reads (19: 16): "Accepting these (books) Boethus left Rome before me in order to take up his governorship of Palestine, Syria, where he died." Confident from other sources that Galen visited Palestine at this time I cannot help but think that he failed to learn of the death till after his arrival.

YEAR OF BIRTH 131 A.D. Knowing that he arrived in Rome in 163, but without knowledge of the fact that he was born in September, several authorities take his statement that after his thirty-second year he dwelt in Rome (18_1: 347) and conclude that he was born in 131. This birth date could only be correct if he arrived in Rome after September 163, and in this case he would not have been in Rome three years when he left early in 166.

YEAR OF BIRTH 129 A.D. Still other biographers recognizing that he left Rome in 166, and believing he was thirty-seven at the time consider he was born in 129. If he remained but three years in the Capital this contradicts his assertions that after the thirty-second year he dwelt in Rome (18_1: 347) and that he was only thirty-three after being in Rome some time (19: 15). If he remained the five years necessary to make these assertions true he would have left Pergamum in 161, while we know that his official position in connection with the gladiators continued until August, 162 (13: 600). This conclusion also ignores his visit to Cyprus, which he states was made about this time (12: 227).

The majority of investigators place his birth in 130 A.D., and this date can be made to correspond most readily with the history of the times and with what appear to be inconsistencies.

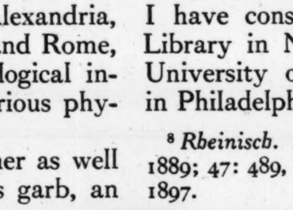
SUGGESTION. Since 1930 represents a centenary anniversary of Galen's birth, I would suggest a commemoration at an Autumn meeting of Medical Historical Societies, and particularly at that meeting which occurs nearest his birthday, namely, September twenty-second.

This commemoration might follow the lines of the recent Harveian Centenary with a display of his voluminous works, of anatomical charts indicating his numerous discoveries, and of illustrations from the times depicting his surroundings and contemporaries. Further exhibits could include the surgical instruments of the age, particularly several which Galen himself devised or improved, and some of the many useful, and others of the many ridiculous prescriptions. Articles might be read explaining the different exhibits.

Accompanying papers could be made interesting on his studies in Pergamum, Smyrna and Alexandria, his practice in Pergamum and Rome, his anatomical and physiological investigations, and the illustrious physicians who preceded him.

Since he was a philosopher as well as a physician, even in his garb, an article on the philosophical sects, how they conducted themselves, what they taught, and how little they accomplished, would add to the interest. A sketch of the five Emperors of his acquaintance, and his association with them, especially his association with the saintly Marcus Aurelius and his son, the brutal Commodus would not be amiss.

The most detailed and accurate account of his writings and the order of their succession is by Johannes Ilberg: Ueber die Schriftstellerei der Klaudios Galenos.[8] This work is more commonly found in large public than in medical libraries. The two places I have consulted it are the Public Library in New York City and the University of Pennsylvania Library in Philadelphia.



Silver Coin with Head of Vologeses iii, the Parthian Ruler, Who by His Revolt Forced Galen from Pergamum to the Capital, Where His Remarkable Physiological Writings Were Adequately Promulgated. (From Duruy.)

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[8] *Rheinisch. Museum f. Philol.*, 44: 207, 1889; 47: 489, 1892; 51: 165, 1896; 52: 591, 1897.

"A PITIFUL, RICKETTY, GASPING, STAGGERING, STUTTERING TOMFOOL"

THE MENTAL AFFLICTIONS OF CHARLES AND MARY LAMB

By ROBERT L. PITFIELD, M.D.

PHILADELPHIA

IT is said by E. V. Lucas in his life of Charles Lamb that the novelist Thackeray, after reading a letter written by the gentle Elia to a brother poet Barton, pressed the letter to his forehead exclaiming as he did so, "Saint Charles." There was little in the letter to call forth such an expression, nothing that the present day reader can discern. Lucas in speaking of it said: "It is not much, but the thoughts behind these few lines are not common possessions, so uncommon in fact that they belong only to sweet-souled persons or, if one prefers, saints and when Thackeray laid the letter to his forehead he had full reason." As far as the contents of the letter went, the sole thing that could have moved him was a delightful postscript to Barton's little daughter, in which among other things, Lamb says that her letters to him were so daintily written that she must have used the feathers of a robin or a wren out of which to make her quill pens. But Thackeray was thinking more of Lamb's devotion to his sister Mary than any matter in the epistle to Barton, I am sure.

Perhaps the best of all the many and varied elements that made up the character of Lamb, the little stammering clerk in an importing house in London, were his sweet amiability and his courage. Starting life humbly as the son of a servitor clerk to an old bencher in the Inner Temple (1775) and educated in a charity school, he learned, early in life, to distinguish that which was fine and lovely from the dross and to follow it.

It was this selective faculty and his pursuit of noble things which made him the famous literary man he became and his sweetness and his wit made for him fast friends of the greatest literary men of his day. His sparkling wit, generally kind, but sometimes oversharp, was the flux that made molten the affections and appreciations of such men as Wordsworth, Coleridge and Hazlitt.

The most sterling and outstanding trait of this little man was his unfailing devotion to his family, particularly to his sister Mary, who was tragically afflicted for nearly all of her adult life with a circular insanity, the first outburst of which resulted in the slaying of her darling mother. It was from the instant of this deed that Charles Lamb began to lead a life in a large measure circumscribed. It chained him to a long period of desk drudgery in a counting house. Ever afterwards all that he considered or accomplished was adapted to Mary's wishes and to her physical and mental strength. He who could fly was confined to a cage-like office because of this tender devotion that has no equal in all the annals of literature.

An hereditary nervous disposition or weakness was the lot of both Charles and Mary. Very early in

Charles' life after an unhappy love affair in which, as his biographers hint, there was parental opposition to a marriage of their daughter to Lamb, because of the taint of insanity in his family, Charles himself went mad and was confined in an asylum in Hoxton for six weeks. This was before Mary's breakdown and when Charles was but twenty-one years old. All his days he had a nervous stuttering speech. Lucas, his biographer, says that the grey irises of his eyes were pebbled with red. No doubt these were stigmata of degeneration. Undoubtedly some of the ugly but unknown factors that bring about dementia precox in the young lurked in his being all his days. The love disappointment was but the spark that exploded the mine.

Lamb, suddenly going mad, was confined until his recovery. The name of the private institution in which young Lamb was placed is not known, nor are the names of his medical attendants recorded in any of the accounts of Lamb's life. In a letter to his boyhood friend, Coleridge, he writes: "The six weeks that finished last year (1795) and that began this year, your humble servant spent very agreeably in a madhouse in Hoxton . . . Coleridge it may convince you of my regard for you when I tell you that my head ran on you in madness, as much almost as another person [his enamorata] who I am inclined to think was the more immediate cause of my temporary phrenzey." Southey, also a very good friend of Lamb, relates that while Lamb was insane he believed himself for a while to be young Norval in Holmes' "Douglass."

While he was in one of his lucid intervals in Hoxton he wrote a sonnet to Mary, It begins:

If from my lips some angry accents fell
Peevish complaint or harsh reproof unkind,
'Twas but the error of a sickly mind.
And troubled thoughts, clouding the purer well
And waters clear of reason . . .

The little man recovered his reason and returned to his toil in the South Sea House and to his home. The essayist's father, John Lamb, was then in his dotage, his mother was most of the time a serene invalid. Both were a care to Charles and Mary. John Lamb, their brother, was indifferent to his parents' needs. He allowed Charles to take sole care and responsibility of his sister, when she became ill.

Mary Lamb, then thirty-two years old, began to exhibit signs of a serious mental unrest. These signs had appeared before in a minor way in this sad young woman. Suddenly in a paroxysm of rage one morning, she stabbed her gentle unsuspecting mother with a table knife, killing her instantly. This was the beginning of a tragedy that she and gentle Elia were to endure. The relics of it trailed throughout all their days, yet it did not conquer them. Mary was taken at once to an asylum. This was not Bethlehem. The authorities allowed Charles to place his sister in a private retreat. He promised them that he would care for his sister as long as he lived. He kept this promise. Before the tragedy, when Mary exhibited mental symptoms, a Dr. Pitcairne was sought but could not be found. It is likely that if he had been summoned the tragedy might have been prevented.

Coleridge, a schoolmate of Charles at Christ's Hospital and always his friend, wrote a beautiful letter to him which was a great comfort to the poor chap, who was bravely facing such blasts of fate as would have tossed many another man less valiant and reliant into the pits of despair. No doubt the letter of the great poet sustained him. One sonorous passage in it reads: "I charge you my dearest friend, not to dare to encourage gloom or despair—you are the temporary sharer in human miseries that you may be an eternal partaker in the Divine nature."

Of the night that followed the tragedy, Lamb wrote to Coleridge: "I closed not my eyes in sleep that night, but lay without terrors and without despair. I have lost no sleep since." Other friends of the family came forward and aided the forlorn little group. The old man was crippled and far in years and could not go about much if at all. He was dependent for amusement and support upon his son Charles who had himself just been released from confinement in Hoxton, with a mind unsteady. The older son, John, barely lifted a finger in the matter of relieving the stricken relatives, but insisted that Mary should be confined for the rest of her days. At the time of the murder, he was laid up with a disabled leg.

The tender devotion of Charles and the good care received later in a private institution greatly aided in the recovery of Mary from this first of her many fits of madness which she was destined to experience. Charles speaks of the "elegant sweet lady in the sanitarium and her daughter [in Islington] whose real love and sympathy" helped so in the restoration of the sick woman. This was so marked that Mary longed to be with these kindly folk. In a letter Lamb said, "Poor thing, only the other morning she was saying she knew she must go to Bethlehem for life, that one of her brothers [John] wished it so." But the weaker brother was not of the same mind as John. He developed a nobility that ever afterwards marked him. This young man had not only to care for his father, entertain and comfort him, but all day he had to slave at tasks that were entirely uncongenial and in a great measure without aim. Upon his return from work in the evening, his father insisted that he play constantly at cribbage. So, uncomplaining, the desk-frayed nervous man, depressed with the remembrance of the hideous death of his mother and with the great concern for his incarcerated sister, must sit down unrefreshed by food or drink to amuse an old father, who exacted this attention in no very amiable spirit. This is a spectacle for the hero worshippers. Lamb but gently complained of the life he was compelled to live. He could have railed at his fate and deserted his feeble and stricken relatives in their trials. Not he; it was not in his blood. He longed for his books, grown so dear to him early in life, and for the companionship of the great men who were his friends, then marching forward to a world-wide renown. These men had the strength, the means and the leisure to work and to invent. They were unhampered by weak nerves, family distresses and the poverty that was Lamb's. In this unparalleled devotion and turning aside from the delights and joys of life that so many young men in their early twenties take pleasure in, he rises to a height of character unknown to all of us.

All this endears everyone to the lovable Elia. He could easily have added his consent to John's desire that

Mary be locked up for life among the depraved dements of Bedlam. Weary of his old father's peevish demeanor, and fretful of his company and his support, he could have sent the old man to a workhouse. He needed no angel of a conscience to stand with drawn sword barring the way to any such course. He had, this gifted and charming young man to whom the whole world held out "a primrose path of dalliance," an overwhelming love and devotion that brooked no question as to what course he should take. Perhaps he learned deep lessons in pity for others while in the madhouse at Hoxton.

Mary Lamb, in return, was ever an affectionate and devoted sister. She was able later on to supply the companionship and sympathy which his genius needed.

In a letter to Coleridge in which he confides to him every hope and thought, speaking of the great load of irksome care suddenly thrust upon him (it was not only moral but financial as well), Lamb gently murmurs in relating the account of the tragedy in which the old husband and father was wounded by the same knife that accomplished the ending of the wife and mother.

> God be praised, Coleridge, wonderful as it is to tell, I have never been otherwise than collected and calm even on the dreadful day and in the midst of the terrible scene I preserved tranquillity which a bystander may have construed as into indifference, a tranquillity not of despair; is it folly or sin in me to say that it was a religious principle that most supported me? . . . on that first evening my aunt was lying insensible to all appearances like one dying—my father with his poor forehead plaistered over from a wound he had received from a daughter dearly beloved by him and who loved him no less dearly—my mother a dead and murdered corpse in the next room—yet I was wonderfully supported.

Later he continues: "I had the whole weight of the family thrown on me, for my brother (I speak not without tenderness for him), not at any time disposed to care for old age infirmities, had now with a bad leg an exemption from such duties and I am left alone." How the last word wrings all the sympathy from one's heart. Was there ever a more pathetic scene? All except the indifferent brother, were supported, comforted and sustained by a little stuttering man, himself lately mad, in whose nervous system there was not much strength or endurance and whose emotional nature was stirred too deep for tears. Yet he endured it; this fine spiritual hero, steeled with a high courage against the unkindest stroke of fate. With a breaking heart, he might have melted into something worse than uselessness. He kept the sorrowing group together, fed them, comforted them, housed them, encouraged them against want, disease and a great woe. Hats off to this little clerk, frail but courageous, noble beyond most men, trembling but ever strong. He endured.

Mary slowly mended and realized the enormity of her deed of madness. Lamb spoke but once of his mother's lack of sympathetic understanding. Of Mary he said: "I have now by me a letter that she wrote me, for tho' I see her almost every day, yet we delight to write to one another." Mary's letter written to her brother is full of trust; "At midnight when I happen to awaken, the nurse sleeping by the side of me with the noise of the poor people around me, I have no fear. The spirit of my mother seems to descend and bid me enjoy the life and the reason that the Almighty has given me." Talfourd relates that "Mary's calm state of mind in relation to the tragedy continued throughout her normal life."

She became a friend of the Wordsworths and corresponded with Dorothy for many years. Later her mental strength became such that she wrote a book, "Mrs. Leicester's School," a story for children. She also wrote articles on needlework. Later Charles and she wrote "Tales From Shakespeare," he doing the tragedies and she the comedies. This book is read today, still having a vogue after a hundred years. This speaks for the ability, perhaps genius of two gentle people who were compelled to spend parts of their lives immured in asylums.

One cannot read any account of Lamb's life without being impressed with the frequency with which poor Mary was returned to her retreat. Their friends often passed them while on such doleful journeys, both weeping, Mary throwing up her hands despairingly, while Charles carried the straight jacket which was to control his beloved sister until she became calm again. It seems that this return to the asylum occurred at least twenty times during the essayist's life; and poor Mary had to be led along the public streets by her heartbroken brother. He returned to the solitude of his lodgings to find what consolation his books and writings afforded. With the heavy black cloud always hovering over the horizon, ever ready to storm successfully the citadel of Mary's reason and overpower it, he cultivated his splendid and sensitive mind. His tastes were catholic and fine. He loved old masters of English verse and prose, and delved into the writings of the old dramatists. By so doing he forgot for the time being that Mary was locked up and suffering the mental tortures that afflict the insane. His splendid friends (he had many) no doubt were an inspiration and help to him. There can be no doubt of Coleridge's influence which must have been deep. Coleridge was very religious, at that period a Unitarian and his views were adopted by Lamb. I doubt not that Lamb's religious faith was a great bulwark to him in his early troubles. Wordsworth was always a friend and champion of Lamb. Hazlitt was also a close friend. This great critic's friendship speaks for the wealth of Lamb's powers and for the brilliancy of his wit, for his fancy and judgment.

Of Lamb's nervous health it must be related that never was there any return of his malady or of any neurasthenic breakdown. His literary labors were of great help to him; in them he found solace and a delightful form of occupational therapy. No doubt they served him splendidly in many ways. At times he must have been depressed and perhaps despondent, but no jot nor tittle of this is recorded in his life. How much an Ariel-like and sparkling wit disguised a heart that was nigh unto breaking, one can only conjecture.

Perhaps his alcoholism may be construed as pathological. In his time every gentleman got tipsy on occasion, and many of his circle were steady hard drinkers. There can be no doubt that he found infinite solace in the Hollands and hot water that he consumed in large quantities, especially in congenial company.

Lamb wrote an essay entitled "Confessions of a Drunkard." It is one of his best. It must of course be considered that he knew all about the matters of which he wrote. He was never by any means a sot, nor was he a slave to drink in the sense that De Quincey and Coleridge were to opium. Lucas says of the Confessions: "I am constrained to believe that the Confessions . . . an essay written by Lamb, had many true statements in it." This, of course, is first-hand opinion. Lamb could always work, not only at the counting house but at his literary labors; no sot could have done so. He relates that he fell in with some journalists in his early life: "They were boisterous spirits, sitters up of nights drunken." He strove to keep burning the flame of his wit. He outshone his companions with his faculty for the fanciful. It is likely that as Lucas infers, "the constant strain to say something brilliant drove him to drink until he was enslaved of it." When he fell in with the drunken roisterers he was but twenty-six years old. He was notably drunk upon several occasions. William James has put the lessening of restraint that alcohol gives the behavior of men in a very pithy way. He says that "Alcohol says 'yes' to those who use it." To the drudge of the counting house desk, coming home from his toil weary and frayed in spirit, alcohol must have said "yes" very blithely. It unlocked the chambers of his wit and made him popular wherever he went, his native gifts in this matter making him outshine all those whose powers were slower and heavier. He did not die a drunkard; all his life he exhibited control. Yet he indulged himself in public houses and at private parties. He must have been a delightful companion. Far better did he shine in the company of other wits and poets than Carlyle, who wrote that Lamb was a shuffling, stuttering, drunken, insane person.

The essay "Confessions" was written seriously. It ends with a warning to young men beginning to drink, of the peril that lies before them. It was written when Lamb was thirty-eight years old, and at a period in which he did not feel so sure of himself as might be. Perhaps he then thought that drink had a stronger hold upon him than it really did have. It may have been written as a potboiler after the author had been overindulging. There are no dreadful melodramatic incidents and pictures in it as there are in "Ten Nights In A Bar Room." He was in earnest, for he puts his own experience very vividly before the reader. Witness the advice he gives to would-be wits in the matter of stimulants:

> Reader, if you are gifted with nerves like mine, aspire to any character but that of wit. When you find a tickling relish upon your tongue, disposing you to that sort of conversation, especially if you find a preternatural flow of ideas setting in upon you at the sight of a bottle and fresh glasses, avoid giving way to it as you would fly your greatest destruction . . . Write an essay, pen a character or description—but not as I do with tears trickling down your cheeks.

Lamb blames his wit for his failings. He is remorseful: witness his tears of repentance; but he rises above his weakness. Perhaps his sister, the poor afflicted woman, had a strong influence upon him, perhaps her affection curbed him. She was not a useless idle woman by any means. She sewed and was a mantua maker for many years. Then, too, perhaps the steed of his wit had less use for spurs of gin as he grew older.

Mr. Birrell in his "Obiter Dicta" says in a long paragraph:

> One grows sick of such expressions as "Poor Charles Lamb" as if he was of Leigh Hunt's type, perpetually borrowing thru the round of every man's acquaintance . . . Charles Lamb earned his own living . . . paid his way . . . was the helper, not the helped . . . Poor Lamb, indeed! Poor Coleridge, robbed of his will . . . poor Wordsworth consumed by his own ego . . . poor Carlyle, with his nine volumes of memoirs, where he
>
> Lies like a hedgehog rolled up the wrong way,
Tormenting himself with his prickles.
>
> Call these men poor, if you feel it decent to do so, but not Lamb who was rich in all that makes life valuable and memory sweet. But he used to get drunk. This explains all.

Lucas relates that for a period of about five years when Lamb was in his early thirties he was notably alcoholic. This caused some discord between him and his sister Mary.

Carlyle visited Lamb when he was more advanced in life, Lamb being then fifty-six while Carlyle was twenty years his junior. He described in detail all his impressions in his diary. All that he wrote was most unkind and contemptible; it reveals a brutal lack of sympathetic understanding on the part of the philosopher. The cockney can never be liked by the solemn, psalm-singing, porridge-supping Calvinists of the North, nor can they be in turn admired by the children of frivolity "mostly fools," as Carlyle thought Londoners. In writing about the manners and talk of literary men of the day he says: "Wearisome inexpressively wearisome to me is that sort of clatter, it is not walking, (to the end of time you would not advance) for these persons indeed have no WHITHER. It is not bounding frisking joy, it is dancing—a St. Vitus dance! Heigh ho!" Then he proceeds to flay Lamb and his sister:

> Charles Lamb I sincerely believe to be, in a considerable degree, insane. A more pitiful, ricketty, gasping, staggering, stuttering Tomfool I do not know. He is witty by denying truisms and abjuring good manners. His speech wiggles hither and thither with an incessant pitiful fluctuation, not an opinion in it or a fact or a phrase that you can thank him for . . . Besides he is a confirmed and shameless drunkard, asks vehemently for gin and water in strangers' houses, tipples until he is utterly mad and only not thrown out of doors because he is too much despised for taking such trouble with him. Poor Lamb; Poor England when such a despicable abortion is named genius. . . .

Lucas, in commenting upon this venomous entry in the diary, says: "I like to think that the poor broken down cockney sized up the visitor in a twinkling and decided to give him what he merited." Lucas further relates that at supper in which a bowl of Scotch porridge was placed before Carlyle, Lamb's remarks upon it were such as to almost lead to an open quarrel. Lamb's friends say that he was openly offensive. I agree with Lucas that Lamb's marvelous intuitive powers at once sensed a hostility toward him on Carlyle's part, and he paid him back in some smarting witticisms that made Carlyle furious for thirty years. For a later entry in the "Reminiscences," Carlyle wrote; "Charles and Mary Lamb came daily once or oftener—a very sorry pair of phenomena, his talk contemptibly small, indicating wondrous ignorance and shallow . . . emblem of imbecility, in walking, tottered, shuffled . . . "

All this venomous obliquity, written about a thin, nervous little cockney essayist, who was a close dear friend of the poet laureate of his time, warmly admired by Southey, subsequently also a laureate, and by Shelley and Hazlitt! Wordsworth thought so well of his literary judgment that he arranged through friends to have Lamb review his great poem "The Excursion" in the London magazine. All this miserable and imperfect sympathy by Carlyle for a gentle soul whom Thackeray, that astute observer of human values and conduct, dubbed "Saint Charles!"

Carlyle fuming and smarting under the witticisms flung at him by the little stuttering cockney, stated that he knew at least thirty Scotch farmers from his shire who could blow Lamb to the zenith when it came to matching wits. This is so extravagant that it only confirms the opinion of Lucas that the testy philosopher was much piqued by little Lamb.

Perhaps the critical student of behavior will find much fault in the conduct of the poor little stuttering man who had constant resource to the gin bottle to speed up a wit until it was oversharp, many a time to the discomforture of his friends and foes. This tendency to overbubble with good and bad jokes, (always clean) the shuffling gait, the painfully thin body and legs (Lamb weighed but 120 pounds and his legs were as thin as poles) his gasping breathing that Carlyle noted, all things he could not help, speak for irregularities in nervous and mental control.

Carlyle may have been of that group of intelligent and often gifted people who, while they never sneer at a man so unfortunate as to be born with a club foot, yet cannot endure and even sneer at a man born with a club-footed mind. Lamb never laughed at anybody's infirmities; he had too much tenderness.

Once, probably when tipsy, he pulled Wordsworth by the nose and declared him to be "a dear old Lake poet." That was an irregularity that only a very dear friend would brook.

In his essay on "Imperfect Sympathies," Lamb wrote; "I have been all my life trying to like Scotchmen and I have been obliged to desist from the experiment in despair. They cannot like me—in truth I knew one of that nature who attempted to do it . . . *we know one another at first sight.*"

Herbert Paul, an intimate of Carlyle, becoming his literary executor after his death, editing his diary and Reminiscences, says in his splendid biography of J. A. Froude, the historian: "A few more omissions might have been made with advantage, especially a brutal passage about Charles Lamb and his sister, which Elia's countless admirers find hard to forgive." Later the same author says of Carlyle, "If Carlyle's way of writing about people, for instance Charles Lamb (Thackeray called Saint Charles), is sometimes unpardonable; if Froude had suppressed this passage he would have done well."

The strict critic of behavior would have stood aghast when Charles, while entertaining some friends, suddenly detecting the return of Mary's malady and fearful of a scene and wishing to divert the company from observing it, placed an empty teakettle on Mary's head singing the while, his heart nearly breaking.

Of his many witty sayings and funny pranks, space will not permit any detailed accounts; besides they are too well known. One of his remarks is notable: speaking of his dear religious friend, Coleridge, whom he greatly loved, he said, "An archangel—a little damaged." Everyone knows of Coleridge's addiction to opium, and of his futile attempts to break off the vice, for he died an addict.

Lamb's writings are always serenely sane. He is always a humanitarian, and a good deal of an egoist in a charming way, using himself or his experiences freely in his essays.

He was always a smoker of tobacco, Orinoco preferred. He made many attempts to break off the habit. He wrote on ode, "Farewell to Tobacco;" nevertheless he always returned to his wicked lady of the weed. Once the very learned Dr. Parr, seeing him "puffing out smoke like furious enchanter," asked him how he had learned to smoke at such a furious rate. "I toiled after it, sir, as some men toil after virtue." Writing to Coleridge and begging for advice about tobacco (for he often spent half the night smoking furiously as many as ten pipefuls, waking the next morning with a dizzy head and some depression), he concluded, "Maybe the truth is one pipe wholesome, two pipes toothsome, three pipes noisome, four pipes fulsome and five pipes quarrelsome."

He was religious always, and he was reverent. Everybody remembers his quick remark to a company who were talking about the appearances of certain dead notables with whom they were acquainted through their writings or deeds and whom they most desired to see. He exclaimed at the mention of Christ's appearing, "We would all kneel and kiss the hem of his garment."

He wrote very tender English; his style is ever clear and limpid. It lures one forward always. It is lovably intimate like its author, it is ever charming in its naivety, personal but never offensive or tiresome. As a conversationalist and as a writer Lamb was always an entertainer, a whiler away of idle hours, for he was not so much an instructor as a companion, and a sweet one at that. When he talked in a serious vein, he matched his wit and his judgment with the best literary minds of his time and was their equal. Some critics say that he lacked in imagination, that he could not soar high. He could turn from the high-minded to the humorous and trivial, to sheer nonsense and fun with astounding ease; and his quill pen was just as facile.

Once when overbored with desk drudgery in the East India House, he came to his duties late. He marched straight through the office, saying that he had trod on the heels of a butcher and that the man was pursuing him with a knife to kill him. He seemed breathless and agitated. Without removing his hat or making any pretense of remaining, he marched on out another door and was gone for the day. That was his way of taking a holiday without leave.

An account of a boisterous party in which Lamb was a guest must be related because it gives a glimpse of the kind of fun, unbridled madcap fun, of which he was capable. Haydon, the painter, was the host, Wordsworth, Crabb Robinson, Keats, Landseer and Lamb were of the party. A man named Kingston, who told the host that he was acquainted with Wordsworth, also came. He was comptroller of stamps in the tax office and by no means a literary or artistic person. He had corresponded with Wordsworth. Haydon tells of the sports of the wild night. In Haydon's words:

> The immortal dinner came off in my painting room . . . Wordsworth was in fine cue; we had a glorious set-to—on Homer, Shakespeare, Milton and Virgil. Lamb got exceedingly merry and exquisitely funny, and his fun in the midst of solemn intonation of oratory was like the sarcasm and wit in the intervals of Lear's passion. "Now," said Lamb to Wordsworth, "you old Lake poet, you rascally poet, why do you call Voltaire dull?" Lamb made a speech and voted me (host) absent and made them drink my health . . .
>
> After a time the comptroller of stamps was introduced to Wordsworth; sitting down he asked the great poet, "Don't you think, Sir, that Milton was a great genius?" Keats looked at me, Wordsworth looked at the comptroller, Lamb who was dozing by the fire, turned round and said, "Pray, Sir, did you say that Milton was a great genius?" "No, Sir, I asked Mr. Wordsworth if he were not." "Oh," said Lamb, "then you are a silly fellow." Wordsworth remonstrated, "Charles, my dear Charles." Perfectly unconscious of any confusion Lamb sat by the fire again.
>
> Again the comptroller, after an awful pause, asked Wordsworth, "Don't you think Newton a great genius?" I could not stand it any longer, Keats put his head in a book, . . . Lamb got up and taking a candle said, "Sir, will you allow me to look at your phrenological development?" He turned his back on the poor man and at every question of the comptroller, he chanted . . .
>
> Diddle diddle dumkins my son John,
> Went to bed with his breeches on.
>
> This he repeated over and over to every remark that the blundering comptroller made, until the other guests took him away and locked him in the painting room.

In Amy Lowell's life of Keats, this party is spoken of as truly Elizabethan.

We must not omit to mention that Lamb had a love affair later in life. It was his great delight to go to the theater whenever an actress named Kelly was on the boards. She was a friend of the Lambs and often sent them "bones" or passes (bone coins). She was ever so friendly and charmingly sprightly that Lamb fell in love with the clever woman. He wrote a note to her declaring his passion and on the same day received a reply from his enamorata, declining his hand. Miss Kelly said in her very amiable letter that she had set her heart upon another man. "Thus," says Lucas, "the little drama of a day was over." Miss Kelly, a woman with a "divinely plain face," may have had in mind the unstable mental state of Mary Lamb. Charles took this disappointment very calmly and bravely. His letters to Miss Kelly are charming.

In his sixtieth year Lamb was wounded by a fall upon a stone while out walking. Erysipelas soon set in and he died. His passing was, as he lived, peaceful and gentle.

The latter part of his life was sweetened because the company for which he had slaved for so many years pensioned him handsomely, giving him what he longed for, "a few years between the desk and the grave." Lamb left a legacy to his sister, his dearly beloved, of £2000, ever mindful of the comfort and support of her whom he had loved best, and to whom he had devoted so many sad hours. He could not think of her impoverished and in want; not he. He had not lived that way. After his death the company continued his pension to Mary, who survived her brother by ten years. She was born eleven years before him. Thus was the end of a perfect man.

Lamb left after him two series of Essays of Elia which still delight the minds of the lovers of good literature and will always be read, and a few worthwhile poems that can be found in all of the best anthologies today. He wrote an unsuccessful play "John Woodville" and he saw the production of another that was shortlived.

There can be no doubt of the moral worth of this little man. It was only the evidence of a young country-bred philosopher from a bleak shire in Scotland that seriously impugned it. This critic had his faults. Froude records that his wife, Jenny, bore certain blue marks upon her wrists after quarrels with her testy husband. The only blue marks that appeared on Mary's wrists were made by the straight jacket. It is not necessary to continue an ugly parallel any farther. Froude has told of another disability of Carlyle's that it is not well to discuss in public. Both were eminent men, both saw the beauty and the duties of life plainly, but from different viewpoints, as they had been reared. The outstanding moral feat of Lamb was his unceasing devotion to his afflicted sister.

Wordsworth wrote a long poem for Lamb's tomb, for the stuttering Tomfool. It commends his brotherly care. It begins:

> To a good man of most dear memory,
> This stone is sacred . . .

ELIA

Across the English meadows sweet,
Across the smiling sunset land,
I see them walk with faltering feet,
Brother and sister, hand in hand.

They know the hour of parting nigh,
They pass into the dying day,
And, lo! against the sunset sky
Looms up the madhouse gaunt and gray.

He keeps the lonely lamp aglow,
While old loves whisper in the air
Of unforgotten long ago
Before his heart had known despair.

He waits till she may come once more
From out the darkness to his side,
To share the changeless love of yore
When all the old, old loves have died.

Between me and this gentle book,
Shining with humor rich and quaint,
The sad scene rises, and I look
Upon a jester—or a saint.

I lift my eyes, still brimming o'er
With love and laughter—and there falls
Across the page forever more,
The shadow of the madhouse walls!

E. J. MCPHELIM

SOME DISEASES OF ANCIENT MAN

By JOSEPH L. MILLER, M.D.

CHICAGO

PREVIOUS to the advent of artificial mummification, about 3000 B.C., bodies buried in the dry sands of Egypt and Nubia were so well preserved that good microscopical sections have been made of the various tissues and organs.

G. Elliot Smith,[1] the English anatomist, states that about 30,000 mummies, extending over a period of 6000 years, have been examined. Advantage has been taken of this opportunity to study human paleopathology.

Roy L. Moody,[2] formerly of the University of Illinois, has made an exhaustive study of paleopathology, based in part upon his observations on fossil animal remains.

Sir Marc A. Ruffer,[3] born in France but educated in England, who spent most of his life in Egypt, not only studied gross pathology in mummies, but was further able, by means of a technique he devised, to make good microscopical sections of skin, liver, kidney and lung; muscle sections show beautifully the cross striation of the fibers. Calcification of arteries could be clearly demonstrated. He was even able to show bacteria in the tissues, which he believes gained access to the body previous to mummification.

In addition to the Egyptian studies, some work has been done on Peruvian mummies by Warren R. Dawson[4] and H. U. Williams.[5] These mummies are of comparatively recent date, about 700 A.D.

A further source of information has been a study of skeletons of pre-Columbian mounds, for which we are especially indebted to Ales Hrdlička, now of the Smithsonian Institution.

It is apparent that evidence gathered by these methods must cover a limited field. It enables us, however, to determine the presence of diseases involving the osseous system: as rickets, bone tuberculosis, dental caries, gout, leprosy, syphilis, osteoarthritis, fractures and bone tumors. Biliary and urinary calculi were well preserved as were calcified arteries.

Breasted says it is now definitely determined that civilization first arose in Egypt, spreading to contiguous regions of Northeastern Africa and across to the adjacent Southwestern Asia and later to Southeastern Europe. The invention of alphabetical writing originated in the Orient, and this made possible the recording of events with a considerable degree of accuracy.

As Egypt was the cradle of civilization, a study of its ancient remains, some of them 6000 to 8000 years old, offers an opportunity to observe disease of earliest civilized man. The very large numbers of mummified bodies or well preserved skeletons make it possible to determine not only the presence but the prevalence of certain diseases, evidences of which have withstood the ravages of time.

During this period Greek civilization was unknown. The first civilization of Southeastern Europe was oriental, having its origin in Egypt, finally to be replaced by Greek culture. As we will see, preceding the

Christian Era, certain diseases such as gout, bladder stones and malignant tumors were not uncommon in Greece, but did not appear in Egypt until centuries later. Why this early appearance in Greece, we cannot explain, but probably the manner of living and climate played a rôle.

Egyptian literature throws little light on the origin and purpose of mummification. It was probably an effort to maintain the body of a dead king in approximately its normal state, so that he might maintain his existence indefinitely, thus attaining immortality. However, even in the beginning, mummification was not confined to kings, but became a method of burial first of the aristocracy and finally of the common people. By the beginning of the Christian Era, it became almost universal among the Egyptians. In fact, it was not confined to Egypt but spread over Northwestern Africa and across to the Canary Islands. Eastward it traveled to India, Ceylon and eventually to Central America and Peru.

Previous to the first Dynasty, or approximately at 3500 B.C., the Egyptian dead were loosely wrapped in linen or skins and placed in shallow graves in the desert sand. The heat and dryness of the climate desiccated the body leading to a natural mummification. It is not improbable that this led to efforts at improving on nature's methods.

Beginning at this early period, artificial mummification reached its greatest perfection during the twenty-first Dynasty, 900 B.C. Following this, it declined but still lingered in certain parts of Egypt and Nubia long after the beginning of the Christian Era.

Little is known of the actual technique of mummification, as the process was secret and passed from father to son. The expense of the procedure depended upon the means of the family; and three methods, from a cost standpoint, have been reported.

The first method required seventy days and cost about $1200. Probably a considerable part of this time was devoted to dehydrating the body. The method of desiccation is not known, but probably sunlight or a slow fire.

The second method was relatively simple. The intestinal tract was cleansed and cedar oil was injected per rectum. The body was then soaked in crude sodium carbonate for a prescribed number of days after which the cedar oil was allowed to escape from the bowel. The body was then desiccated and the process was complete.

The third method was very inexpensive, as it consisted merely of washing out the intestinal tract and placing the body in a carbonate of sodium bath for thirty days; followed by desiccation for forty days.

The first method was more elaborate. By means of an iron hook the brain was withdrawn through the nostril; following this the cranial cavity was flushed out with a caustic solution. An incision was then made in the lower left quadrant of the abdomen. The intestines, liver and spleen, but not the kidneys, were removed and cleansed. The lungs were then removed by passing the hand up through the diaphragm, but the heart was usually left in place.

The body cavities were carefully cleansed with palm wine, following which they were filled with pounded myrrh, cassia or other perfumed gums. The removed viscera were cleansed and embalmed and then either wrapped separately in linen or rags and placed in the abdominal cavity or placed in canopic jars which in turn were placed in a box to be buried with the body.

After the abdominal cavity had been packed the incision was closed and the body placed in a bath of crude sodium carbonate, where it remained not more than thirty days. At the end of this period the skin was largely macerated. The body was then desiccated in the sun or over a slow fire. The embalming process was completed by wrapping the body in strips of linen soaked in gum.

According to Dawson, up to the sixteenth century, B.C., the brain was not removed. The methods above described, taken from Herodotus, were not by any means the only processes of embalming. At times, both abdominal and thoracic viscera were removed through the anus.

As stated previously, embalming reached its highest stage of development about 900 B.C. An effort was made at this time to give the body a lifelike appearance. Packing was introduced under the skin to round out the form. The cheeks were filled out by stuffing the mouth with sawdust, linen soaked in resin, butter or even clay. The legs and arms were packed by making incisions through the skin or through the abdominal incision. When the entire body was brought to lifelike dimensions, it was painted red in order to give it a lifelike appearance. Artificial eyes were placed in the sockets. Not infrequently, the artificial eye was an onion, or where expense was not considered, a white stone with black inset.

Moodie found bacteria in fossil algae deposits, the oldest fossil-bearing rocks in North America. He observed evidence of infection in the regions of bone injuries in the oldest skeletal fossil remains. He has also called attention to a very interesting observation of Cockerell who discovered the fossil remains of several species of the tsetse fly in the Florissant shales in Colorado. This fly at present acts as a carrier of Trypanosomeae from sick to well animals and to man and is responsible for the African sleeping sickness. Moodie suggests the possible rôle such infections might have played in the disappearance of certain species of mammals.

Moodie has also called attention to the great frequency of osteoarthritis, especially in the spine, in prehistoric mammals. It is present in the dinosaurs that lived 100,000,000 years ago. The Egyptian crocodiles of the Miocene Period, 15,000,000 years ago, may well have suffered from lumbago. The cave-bear, the American camel and the saber-toothed cat, judging from their bones, were harassed with pains of osteoarthritis.

OSTEOARTHRITIS IN MAN. Osteoarthritis of the spine is the most ancient disease of which we have any record. It was present in the upper end of the femur in the oldest human remains, namely the skeleton of Pithecanthropus erectus, exhumed in Java and estimated to be 500,000 years old. It was found in the Neanderthal man, dating back perhaps 25,000 years.

The oldest Egyptian remains reveal the great frequency of osteoarthritis, especially of the spine. Ruffer found it in 40 per cent of the predynastic skeletons, and in one predynastic cemetery in Nubia practically every adult gave evidence of this disease. It was found with equal frequency in both sexes. The soldiers of Alexander the Great and the ladies of pleasure who accompanied them were equally afflicted.

The skeletons in our pre-Columbian mounds indicate that osteoarthritis of the spine was very prevalent in the American Indians or their forbears. Hrdlička[6] found evidence of it in 50 per cent of the skeletons exhumed from mounds in Louisiana and Arkansas. Osteoarthritis of the extremities, judging from reports, was extremely rare.

In one group of the Third Dynasty, 25 per cent of the bodies showed evidence of sacroiliac arthritis, and complete ankylosis was not infrequent. The hip joint came next in frequency, but on the whole was only infrequently involved.

ARTERIOSCLEROSIS. The aorta and arteries of the lung and the extremities were well preserved in both natural and artificial mummified bodies. They furnish abundant evidence that 8000 years ago arteriosclerosis of the present-day type was common among the Egyptians. The form with calcifications was the only type sufficiently well preserved to permit of careful study. This is the usual form of arterial change found in the aged. As the Egyptians did not use tobacco or strong alcoholics and syphilis was unknown, these as factors could be ruled out. Whether the hyperplastic arterial change found with hypertension was prevalent is not recorded.

Ruffer, by placing these arteries in a softening solution of alcohol and sodium carbonate and then hardening them in alcohol, was able to secure some excellent microscopical sections. Some specimen slides came from the Hearst Collection, dating back 6000 to 8000 years.

From this same collection he obtained satisfactory sections of skin, lung, liver and kidney, the nuclei sufficiently preserved to take the stain. In a mummy of a later date there was evidence of consolidation of a lower lobe of the lung; the alveoli were filled with an exudate and he reports that he was able to demonstrate Gram-positive diplococci.

POTT'S DISEASE. Only one clear-cut case of tuberculosis of the spine was found in the examination of about 30,000 mummies. This particular specimen was carefully studied by Sudhoff, the German medical historian. The mummy was that of a young person, a priest of Ammon of a period about 100 B.C. The lower dorsal and upper lumbar vertebrae were involved and there was a right-sided psoas abscess. Moodie refers to a second case described by Bartels, on a skeleton dating back to about 5000 B.C. It is a question, however, whether this deformity of the spine is tuberculous or of other origin. Years ago, many mummies with marked osteoarthritis of the spine were considered tuberculous. Hrdlička, of the Smithsonian Institution, states that he has never seen tuberculosis of the spine in the skeletons from Indian mounds. He has found in these mounds clay images depicting the characteristic deformity of Pott's disease and there is a collection of such images in the Peabody Museum at Harvard. In a recent communication Hugh J. Means[7] reports 2 cases of Pott's disease in five hundred skeletons removed from Ohio mounds.

PULMONARY TUBERCULOSIS. The evidence in regard to the absence of pulmonary tuberculosis is not convincing. The lungs were not sufficiently well preserved to permit of careful study. We may presume, if adhesive pleuritis were present, the removal of the lungs would leave fragments adherent to the pleural cavity. Ruffer reports only 1 instance of this character and it was his opinion that this patient had pneumonia. He states, however, that in Later Coptic bodies dating to 500 B.C. where the lungs had not been removed, apical adhesions were not infrequent.

F. Wood Jones[8] was unable in 6000 bodies to find any evidence of pulmonary tuberculosis, and expresses the opinion that it was not present in Nubia at this early date.

RICKETS. It is very interesting to know that rickets was unknown in ancient Egypt, at least in man. Hrdlička, in his careful study of ancient remains in North and South America, has never seen any evidence of this disease. Moodie reports evidence of rickets in prehistoric mammals. In Egypt, a dead man's pets were embalmed and placed in his grave; and evidence of rickets has been found in mummified apes. It is not improbable that the absence of large cities and the almost perpetual sunshine of Egypt account for the absence of rickets.

LEPROSY. Biblical history would lead us to believe that leprosy was a very ancient disease. It has been claimed, however, that the Hebrew word translated as leprosy was a general term for a communicable disease. A. Sachs[9] has recently expressed the view that biblical leprosy was a form of elephantiasis. It is generally accepted that the term Arabian leprosy is synonymous with elephantiasis. In all the remains studied in Egypt and Nubia no evidence was found that leprosy existed previous to the early Christian era or about 600 A.D. It is highly improbable on account of bone involvement that this disease could have been overlooked. The question arises as to whether leprosy was prevalent at an early period in Greece. Hippocrates refers very briefly to leprosy, and considered it curable especially in children. Galen claimed that the Greek word used by Hippocrates did not mean leprosy but elephantiasis.

SYPHILIS. The origin of syphilis is still a mooted question Sudhoff,[10] who by the way denies its American origin, recently collected the earliest printed literature on this subject. The first paper was published in 1495.

Syphilis was discussed at the diet of Worms[11] in March, 1495 where it was considered as a new sign of divine wrath. In August of the same year an imperial edict was drawn up and widely circulated notifying the municipal authorities of this terrible new disease and ordering them to banish syphilitics from the city.

The first authentic evidence of syphilis in the British Isles is contained in an edict[12] issued by the Council of the borough of Aberdeen, April 21, 1497, calling attention to this new disease and the best method of controlling it.

Fracastorius,[13] both scientist and poet, in his famous poem, "Syphilis or a Poetical History of the French Disease" published about 1535 believes it had a dual origin, arising independently in America and southern Europe. He, however, places the time of its origin in Europe shortly after Columbus' return from his first voyage to the West Indies, March 4, 1493. In regard to its presence in America, he makes the following statement:

Yet where the restless ocean finds its bound
The world so lately by the Spanish found

Beneath this pest the wretched natives groan
In every nation there and always known
Such dire effects depend upon a clime
On varying skies and long revolving time
The temper of the air, the plague brought forth
The soil itself disposed for such a birth.

Just recently some interesting new light has been thrown on this subject by Montejo and Robledo[14] who have studied some old manuscripts of Spanish historians and scientists, most of whom were contemporaries of Columbus. One of these writers relates that Columbus' sailors suffered from bubas which they contracted from the Indian women. Montejo believes that the bubas here referred to was synonymous with syphilis. Upon this point, however, there is considerable difference of opinion. The historian further relates that from this source the disease was spread throughout Europe, largely by the soldiers of Charles VIII. He also calls attention to the Indians' use of guaiac in the treatment of this disease, an agent employed in Europe for 200 years following this, in the treatment of syphilis.

Another writer of this period spent several years in tropical America. He refers to the Spaniards suffering from bubas contracted from the Indian women, in whom the disease caused very little trouble, although it was very severe in the Spaniards. The writer states that this disease had been present among the Indians long before the appearance of the Christians.

Another writer of this period relates that syphilis appeared in Barcelona in 1493. Columbus landed at Palos, March 4th, 1493. The Spanish sovereign was in Barcelona and at her request Columbus journeyed there with some of his officers and the Indians he had brought with him. The outbreak of syphilis occurred shortly after this. This same authority claims that the pilot of the Pinta had syphilis. This ship was separated from the Nina and landed at Bayonne in Spain.

There is considerable evidence that syphilis was disseminated throughout Europe and the British Isles following the Siege of Naples in 1495. The nondescript and mercenary army of Charles VIII, composed of soldiers of fortune from various parts of Europe, is reported to have contracted the disease during the Siege from some ladies of pleasure accompanying the Spanish army. The disbanded army is supposed to have spread the disease throughout Europe.

A careful study of Egyptian and Nubian remains has failed to show evidence of syphilis. Ruffer made a special study of the skeletons of Alexander's army, buried near Alexandria, with negative results.

If syphilis could be demonstrated in pre-Columbian remains in America it would furnish excellent evidence of its origin in this country. Ales Hrdlička, the recognized authority on American paleopathology, following an inquiry has written me as follows: "Pre-Columbian syphilis is still a mooted question. We have to this moment no positive proof of it. I know of no positive sign by which, especially in the earliest stages, a non-syphilitic inflammation of the periosteum or the bone can be told from syphilitic."

Recently, Means[7] has reported the presence of syphilis in two skeletons from mounds in Ohio. If this can be definitely confirmed, the discovery is significant, especially if it can be shown that these bones are pre-Columbian.

GOUT.. Gout was not unusual in

Greece at the time of Hippocrates.[15] Probably the Egyptians, on account of their manner of living, escaped this painful malady. They used wine rather freely, but no distilled liquor. While reputed to be temperate in the use of alcohol, drawings on tombs suggest that they occasionally imbibed freely. No evidence of gout has been found in Egyptian and Nubian remains previous to the Christian Era. Only once has gout been found in an Egyptian tomb. This subject was an old man, a foreign Christian, who had migrated to Egypt. The deposits in the great toe were well preserved and chemically shown to be urates. The same skeleton showed evidence of marked osteoarthritis.

Malignant Growths. Ruffer and Willmore[16] have studied in detail a tumor of the innominate bone, found in the catacombs at Alexandria, dating to about 300 A.D. It was impossible, on account of the condition of the bone, to make a microscopical examination. He ventures the opinion, however, that it was probably an osteosarcoma. Elliott Smith refers to an osteosarcoma of the femur and another of the humerus, from a much earlier period, 2700 B.C. Ruffer does not mention these two cases, and no details could be found in regard to correctness of the diagnosis. If we accept only Ruffer's case, sarcoma dates to about 300 A.D.

Prof. J. H. Breasted[17] states that the word "karkinoma" (referring to a tumor of the breast) first appears in the later Christian documents in Egypt. This is in accord with Elliot Smith's report that carcinoma was first found in Egyptian remains of a relatively late date, 300 A.D. This particular case was a carcinoma of the nasopharynx. Cancer in Greece was recognized at a much earlier date, as Hippocrates discusses the treatment of this disease.

Deformities. There is one instance of cleft palate[18] and several of club foot, including one of the Pharaohs. Dwarfism was common. Dwarfs were favorite house pets of the ancient Egyptians. The smaller the individual, the higher the price. It is claimed that artificial dwarfism was practiced, the child being placed in a frame to prevent its growth. If we are to believe the historians, some of these dwarfs were exceedingly small, as for instance a dwarf who had to ballast himself in order to prevent being carried away by the wind. Warren R. Dawson[19]—has discussed these dwarfs and believes many of them were African pigmies.

Appendicitis. A mummy of a period about 300 A.D. was thought to have suffered from appendicitis.[20] This diagnosis was based on the presence of adhesions in the cecal region.

Mastoiditis. Evidences of mastoid disease were common in both Egypt and Nubia.[21]

Baldness. This was frequently found in men and not infrequently in women. Many of the mummies had wigs. In a few cases, the eggs of lice were found adhering to the hair. Rameses II had blackheads on his forehead.

Circumcision. According to Ruffer, circumcision was practically universal and was probably performed at puberty. Boys under eleven years had not been circumcised.

Urinary Calculi. In an examination of about 30,000 bodies, bladder stone was found in only two. One was in a boy of the pre-Dynastic period; the other in a priest of Ammon of about 1000 B.C. One of these calculi had a uric acid center with a phosphate shell. Only two instances of renal calculi have been reported. One of these stones, described in detail by S. G. Shattock[22] was composed of oxalate and calcium phosphate. Ruffer demonstrated calcified eggs of Bilharzia in the kidneys of two mummies of the Twentieth Dynasty, 1200 B.C. At the time of Hippocrates, bladder stone was prevalent in Greece and in some unexplained manner was very rare in Egypt. C. D. Williams[23] reports finding a bladder stone in the pelvis of a mummy taken from a basket maker's grave in Arizona and dating back at least 3000 years.

Gall Stones. These were found only once and were well preserved.[24] We may infer from this that cholelithiasis was exceedingly rare among the ancient Egyptians and Nubians.

Dental Caries. Elliot Smith reports that in 500 skeletons, chiefly of aristocrats, in the Hearst Collection, dating probably to 6000 B.C., dental caries and alveolar abscesses were found very frequently. On the other hand, F. Wood Jones[25] says that dental caries were exceedingly rare among the common people in pre-Dynastic times both in Egypt and Nubia, becoming more frequent as we approach the Christian Era. This he ascribes to the coarse foods. He further states that long after dental caries became prevalent among the aristocrats the poor people had good teeth. The coarse meal was apparently often mixed with sand from the threshing floor or from the stones used in grinding. It is difficult to explain, on the basis of coarse foods alone, the wearing down of teeth, even in young people, to the pulp, giving rise to root diseases without apparent dental caries. Jones calls attention to the splendid teeth of the Nubians, and the great prevalence of osteoarthritis.

There is no evidence of the practice of dentistry. Not a cavity was plugged. In a mummy of about 200 A.D., in an Egyptian tomb, a number of teeth were found bound together with gold wire. Ruffer expresses the opinion that these were decorative rather than useful.

Bene Van Ripper[26] relates that the Mayas of Central American and Peru were the first to make inlays in teeth. These inlays were of various colored stones and were used for the same purpose as the modern lip stick. Nothing resembling a tooth brush has been found in an Egyptian tomb.

Pyorrhea. A common disease was pyorrhea, and it was found in some of the fossil remains of man in France.

The Edwin Smith papyrus gives the impression that the early Egyptians had considerable knowledge of surgery. A study of mummies fails to support this view. The use of splints is the only evidence of surgical practice.

Trephining. Throughout Europe trephining had been practiced excepting in Greece and Rome, at a very early period, 5000 B.C. There is no evidence that the Egyptians were familiar with this operation. Skulls have been found in France with three trephine openings, the operations having been performed during life. The purpose of the operations is unexplained. All the openings were in the parietal region and the edges were beveled. Probably the operation was performed by scraping with a sharp flint. Judging from drawings, the method of procedure was for the barber-surgeon to sit on a stool with the patient kneeling in front of him. The surgeon's left arm encircled the head to hold it firm. He then proceeded to make an opening by scraping with a sharp flint.

Splints. At a very early period, at least, 3000 B.C., splints were used in fractures. The limb was first wrapped with several layers of bandages. The splinting material was the mid-rib of the palm leaf. After these were in place another layer of bandages, and in some instances strips of wood, were placed along the limb and held in place by strong cords. Fractures were frequent in workmen employed in building the temples and pyramids. Breasted states that in 5000 or 6000 bodies exhumed near the pyramids 9 per cent showed fractures. Jones, in one season's work in Nubia, found 160 fractures: clavicle 20; femur 20; forearm 50; face 12; skull 5. He reports that great skill had been displayed in setting the bones as the final results in most instances were good.

THE MOUSE. Not infrequently the body of a skinned mouse was found in the stomach of a mummy of a child. Some of these dated back to 4000 B.C. Warren R. Dawson[27] has written a very interesting account of the mouse in medicine. The Egyptians believed in the spontaneous generation of the mouse from the Nile mud. Pliny refers to the mouse as "a giver of life" and recommends its ashes in earache, baldness, and also to be rubbed on the teeth to sweeten the breath. On account of its supposed magical origin, the mouse was used as a last resort in severe illnesses of children. Faith in its curative powers still survives, for Dawson relates that mouse broth is still used in England for bed-wetting.

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COPY OF JENNER NOTE BOOK

Edited by LE ROY CRUMMER, M.D.

OMAHA, NEBRASKA

[Sometime since, a portion of the material used by Baron in preparing his "Life of Jenner" came into my hands. There was an almost complete set of autographed first editions of Jenner's works, including copies of the two rare printed circulars used by Jenner to explain his methods of vaccine inoculations; one of the circular letters was extended by a page and a half of observations on the success of vaccination in Jenner's handwriting. The rare first Latin translation, Vindobonae (Vienna) 1799, was also included. An unused original drawing by Sharp, showing accidental inoculation of cowpox on the little finger of the milkmaid, was laid in. There were also copies of thirty of Jenner's letters, many of them used for quotation in the Life. When illegible words were found, the copist clipped these words from the original and pasted them on the copy. Finally, there was the note book, which seemed worth publication, as it gives a view of the range of Jenner's interests, many of which extended far beyond the medical horizon. LeR. C.]

FRAGMENTS, Quotations, etc. etc. found in pocket books and on detached scraps of paper belonging to Dr. Jenner. These were chiefly written in pencil by the Doctor when he travelled alone in his carriage.

Wm. Davies
(nephew to Dr. E. Jenner).

Whatever has proceeded from the Deity, (and all nature is the work of his hands) is perfect according to the principle on which it is formed. How often do we say "this is bad weather—too much rain has fallen this month—the frost has been too long, too severe season." But this cannot be. The weather may be inconvenient for the designs of man, but must always be in harmony with the designs of God, who has not only this planet, our Earth, to manage, but the universe.

The whole creation is the work of God's hands. It cannot manage itself. Man cannot manage it, therefore, God is the manager. Everything then that is must of necessity be *right* though it often appears to the erring eye of man *wrong*.

It is next to impossible that a machine of such immense magnitude as to extend it's movements over the globe, and (unlike that machinery which increasingly moves) at the *fiat* of the Almighty, being built with human hands, can incessantly be in motion without the creaking of a wheel, and therefore some small portion failing, from—

For all we know the orbs we behold apparently moving over our heads, and which we call sun & planets, may be, in comparison with other orbs, no more than microscopic atoms.

During sleep, the mind is totaly unconscious of it's own existence, so that for the time being, it is in a state of annihilation.

God is our Master—we are his servants and move by his impulse & feel by his command & certainly exactly to his order & command. How often have we thought him a hard Master, i.e., that this thing or that has been a cruel disappointment, when time has told us all was Mercy.

Our ordinary language shows us, as it were unconsciously, our ideas of a compound existence; the subserviency of the body to the agency of the soul; "I bore myself out of the house." "I was out of my mind," etc.— my mind was out of me.

Do the rich support the poor or the poor the rich, or do we each reciprocally support each other? Every atom of the creation has an office to perform as a part of one harmonious whole for harmonizing & supporting that whole.

All animated nature from the microscopic speck to the elephant seems to consist of nothing more than one great coral with its thousands and tens of thousands of ramifications & that the parental roof is Deity.

Time destroys all things & brings everything into existence, but only to perish again & so the wheel goes round. Where were the particles that now make myself, or the pen I write with a hundred years ago?

In sleep the animal is reduced to a vegetable state. Irritability remains, but not sensibility.

I have heard of Thee by the hearing of the ear but now the eye seeth Thee. Job. Ch: the last. The above is applicable, to the subject of reform in the education of children.

If man had not the gift of free will, why should the God of retributive justice ever pursue him when he has done amiss?

Man is a riddle, & he has not yet found himself out. With all his supposed acumen he knows not whether the machinery of the mind is in his own hands to work it as he please, or whether it is worked by preternatural powers. Is he himself the mover, or is it done by a power unknown and unperceived?

The brain is a mirror & memory is reflected light.

Few men live so much for the public and so little for themselves as medical men.

Chain coral—a creation of the geologist & not of nature.

The arrangement of atoms constitutes all the difference we see in the different objects of sense forming the material world. The *fiat* of the Almighty arranges, decomposes & reunites.

If any proof were wanting that Moses has described the creation in figurative language, let anyone after he has perused it in the first chapter of Genesis pass to the second where he will find the word *day* used figuratively for *days*.

The great book of the world is open to all eyes; my wish is that every human being might be taught to read it. The poor man does not know what a rich library he is in possession of & that he has an equal right with the proudest monarch on the globe to have access to it. March, 1816.

It is very clear from even a slight examination that the earth has been repeatedly thrown into a chaotic state & out of this confusion has arisen a new arrangement of it's materials. Animals doubtless no longer wanted as links of the animated part of the creation have disappeared & new ones called into existence, as links necessary to support the new fabric. Among these is Man. March, 1816.

Knowing it's stability, I have stood firmly on a rock, regardless of the foam that roars about it.

The world is an ass & a fool (look you) & a prating coxcomb. Fluellin.

We love, we doat upon our children while as yet thier mental facilities are shut up. We love them as they are totally unconnected with the idea of what they are to be—their future destines.

Some imperfection still adhered & ever will to all human beings.

Some animal poisons seem to poison life itself instantaneously, as that of the viper.

There is something in the growth of plants analogous to the growth of animals & which seems to have escaped the observation of the botanist. The size of the leaf for example increases daily, until it has arrived at its full dimensions.

Human life consists in a series of hopes & expectations which can never be realized.

A herd of cows when quietly feeding in a meadow make their slow advance over the pasture with their heads turned from the wind. This appears to be instinctive to prevent their natural enemies (wolves for example) from approaching unawares, as they are quick scented & would thus be sensible of their danger, even tho' they were feeding in a thicket.

If we fear all things that are possible, we live without any bounds to our misery.

Truth shews itself by an openness & simplicity of character. Seneca.

The King in his coronation oath swears that He sho'd administer law & justice with mercy in all his judgments.

Geology appears to be a study which never can attain conclusive results.

Physicians will probably find one great impediment to the progress of their art in the revolutions wch take place in the course of disease.

Morbid action must always precede disease except such as is produced by immediate violence, as a cutting instrument and like.

George Wirtzungius first discovered the ductus pancreaticus in 1642, whc caused so much animosity among other anatomists, that he was shot in his own chamber.

A Saturdays moon and Sundays full
Was never good and never wool.

What is there in the history of nature that is yet perfectly explored? Those, who are most contented with their stock of knowledge are the conceited.

Steam the best thing to kill the red spider.

Wheels come off a carriage—guns burst sometimes; steam packets blow up, throu' some error in their construction, yet we use them & endeavor, by discovering thier imperfections, to improve them.

The brain knows everything that is going forward in the constitution & proclaims it, if necessary; sometimes in an instant, sometimes slowly.

The whole theory built on a well-known axiom of Mr. Hunter's, that two morbid actions do not go on in the same constitution at the same time; that the brain is the foundation from whence flows health, disease and recovery—

Terrestrial animals like the fishes of the sea are enveloped in a shell or something analagous from the human animal & other quadrupeds to the oyster. The unsensitive cuticle in one instance to the thick rugged shell in the other. Vegetables too, seem to be guarded in a similar manner. Some of the most tender have a tunic of flint.

When a man becomes a monk, he is a mere barrel organ set to Psalm tunes.

Physical necessity is too often an over match for moral agency.

The uterus is an animal within an animal causing six hundred griefs for woman. Galen.

How various his employments, whom the world calls idle.

Inserted in the first page of the Bible presented this day to my god-daughter Augusta Bertie Parry.

"Augusta Bertie Parry" with the best wishes and affections of her God-father.

Edw. Jenner.

who most devotedly hopes, as this is the very best book, that was ever written, she will give it not only the first place in her library, but convince those who love her dearly that it occupies the first place in her heart. 1821

Where there is no literature, there is no civilization & European superiority is the result of European science. Hence, the friend of letters promotes the public good & and indirectly assists the cause of virtue, by encouraging abstract pursuits. Fosbrooke.

Is there such a thing in the creation as dead matter? It is certainly undergoing constant mutations, some of which we call death as in animals and vegetables from a sudden change, the putrefactive process commences & decomposition comes on. But the particles are instantly capable of entering into new composition & shewing as much of life as in those they had just quitted. Is this new created life, or is it a continuation of that which previously existed.?

There seems to be no dyspeptia among animals (brutes) when the food wct nature intended for their use is within their reach.

The human body is a kind of commonwealth, the seat of government does not seem confined to one director only, but to several, among which the brain is the chief.

There would be no quacks in the world if Physicians had yet learned how to cure diseases.

The more simple the animal, the more independent it is.

Every solid must have a fluid & from water principally almost the whole of the visible terrestrial objects were formed. Every thing destined to become a component part of vital matter must have been vitalized in a state of fluidity.—

In the opinion of Sir Humphry Davy, every body in nature possesses a certain permanent electric state. Their affinity for each other depends upon this state. If they be in the same state they have no affinity for each other; if they be in opposite states, they have an affinity & this affinity is the greater the more intensely opposite the electric state of the two bodies are.

The great flood in Gloucestershire took place in 1607. Gent. Mag. July 1762.

Sirius according to Herschell is 16,000,000,000,000. Sixteen millions of millions miles from the Earth.

Banks informs me that sheep wct. feed upon the *warth* never rot. His Master Joseph Shurge & John Schurge (Quakers) at Littleton, bought a flock of sound sheep in Dorsetshire, in the early part of last autumn. These all continued sound, while those which are pastured in the meadows adjoining, where the tide does not flow are all rotten, 1812.

EDUCATION

Total ignorance is the abstraction of all knowledge in a human being, whose organs are capacitated to receive it. A man who had never seen a horse or heard of such a thing would not know by looking at it in a field that it would kick, or that a candle would burn his fingers if he had never seen flame.

In 1791, the expenditures of the country was 15,969,000. In 1812, the expenditures was 77,800,000.

Many of those eruptive diseases which are most common, cannot be communicated by effluvia or wretched would be the condition of man.

Poverty & crime advance in this country in parellel lines and with equal steps. Sir J. Mackintosh's speech.

The choicest boons of Heaven are bestowed on man graitiously, light, air, water, simple diet.

The stomach is the keystone of the arch, which supports of the constitution. Weaken it, the superstructure trembles, destroy it, and it falls.

The operations of nature are on a scale too extensive to be measured by days or years; they require ages to produce thier full effect. What appears destructive & desolating at the first view is found on a more comprehensive examination to be attended with permanent advantage. The lava and the ashes which burned Herculaneum & Pompei have furnished abundant harvest for fifteen centuries. The evils that Nature inflicts are transient, but her benefits are of lasting duration.

The sacred scripture forms the only pillow on wct. the soul can find repose and refreshment.

The power & mercy of Providence is sublimely & awfully displayed in lighting & in tempest. It scarcely ever happens during what is called a thunder storm, but we hear of some human being suddenly losing his life by a flash from the heavens. And when the tempest roars around us, we know that some destruction always follows. But how beautifully is power here seasoned with mercy. We are shown that instead of partial chastisement it might have been universal. The Almighty arm that struck prostrate a single individual might at the same time have hurled his bolts on the heads of all. He that directed the storm to show his mighty strength by partial destruction, shows every beholding eye that at his fiat it might have sweft off every living thing. But how beautifully it is modified; it goes just to the point where everything terrestrial seems upon the verge of universal wreck & and then mercifully softens into a calm. How sublime, how awful, is this display of the power and mercy of God.

What is a sympathetic affection—how does it arise? Matter must act on matter to produce an effect.

What are we but phantoms? What do we grasp at or even grasp but phantoms? Where are those animate beings wct. assuming a human form once seemed to fill us with so much pleasure and delight? Can we call upon them? No. Where are they? Are they in the grave? No. Their bodies are for the most part decomposed or dissolved in liquid air, passing apparently into bodies like the somethings, nothing from which they come. But what becomes of the mind? that is another affair.

May it not be in great measure for the purpose of migration, that is going great distances in a short space of time, that the animals, we call birds are possessed of wings.

Dry Rot

This destructive visitant in dewlling houses generally grows & originates in cellars. If persons white-washing cellars will mix as much copperas (fer; sulp) with the wash as will give it a clear yellow hue & repeat this every year the dry rot may be prevented; or its progress stopped, if it has already appeared.—

It is the province of wit to collect & combine; of judgment to separate & arrange, & turn to use. The former is sometimes woefully mistaken for the latter.

The multiplying villanies of nature do swarm upon him. Shakespeare.

If the chains of the coral are not to be considered as subordinate parts of the Weston madripose why are they found beneath it's organic covering, & not on its superficies only?—

Mar. 4, 1818. A dreadful hurricane which continued from the evening till past midnight.

The four great necessaries of life are food, clothing, shelter & fuel, & it is to the skill and labor which the climate of England renders indispensible for procuring the three first of these, that those habits of industry & hardihood are acquired, which are equally conducive to virtue, intelligence & health. Sir G. Blane.

That virtue is most obligatory, on which the most good depends.

All matter may contain life. The enamel of a tooth is as unlike a living thing as a flint. 1801.

The question is this; Am I to make myself miserable & a certain number of those persons with whom I am immediately connected by the ties of consanguinity, early & long continued friendship & come to town to add to the comforts of a smaller number, for whom I have not so high a regard. 1808.

Col. Charteris used to say he would not give a hundred pounds to be virtuous, but he would a thousand to be thought so, because he shall get a thousand by it.

Many catch the mind in portrait painting but L—— catches the soul.

The unpleasant sensation arising from some particular sounds affect the head before the sound is heard, or at least to be recognized as sound, particularly that of a sudden or shrill cough.

Theory—bud—blossom fruit.

The multitude of offenders is thier security & their protection—for there is no quarreling with a public vice, where the custom of offending takes away the shame of it. Seneca.

The author of Moore's Almanac is Henry Andrews. He lives at Royston in Herts—by profession a land surveyor—makes mathematical instruments. This book was first published by Francis Moore, Physician, about 150 years ago.

The human mind is in itself restless. Something adequate to it's powers must call forth it's attention, or it's spirits recoil on itself & thence ensues a languor irksome and injurious. B. P. Huntingsford.

April 1, 1822. Mrs. Davies (Stonehouse) compost for strawberries consists of rotten dung, sifted coal ashes & road drift, put upon the beds & forked in, after being dug two feet deep.

A medical man, from the nature of things, is always groping, like a miner, in the dark without the benefit of a safety lamp.

When we smell smoke, there must be fire.

The brain is the machinery of the mind.

The brain is the fountain, from whence flow health, disease and recovery.

The decomposition of animal & vegetable substances taken into the stomach is brought about by an agency analogous to chemical agency, that is, by the decomposing power of the fluids secreted by the glands, chiefly the salivary & those of the stomach itself. Thus the food of today is converted, among a thousand other things, into an agent for the digestion of the food of tomorrow.

Might not mountains themselves, be they ever so high, have formed the bottoms of antideluvian seas.

Feb. 23, 1816. Saw Mr. Hawker's splendid collection of fossils. He has a species of Oolite wct. seems to throw some light on that wct. forms the top stratum of our hills.

We are in want of the guidance of more steady lights than we at present possess, to enable us to discern the morbid changes of the human structure. We can only judge of a disease by its symptoms and these frequently mislead and bewilder us.

Mar. 1, 1816. Walked to Stone, visited the Wolfershans, the Hicks and the Jenkins.

Mar. 6, 1816. Went to Rockhampton and inspected the child's arm (W. D.) Every puncture took effect and the pustules are quite perfect (7th day) Vaccinated Ann Phillips (infant) from the arm of W. Davies.

Book for Willy. Feby, 1822.

The money belonging to Stephen Jenner this 19th day of May, 1817, amounts to £730.

Nothing contributes more effectually to a man's own happiness & to the advancement of his fortune as the converting of an enemy into a friend. If it be managed with dignity it is so far from a servile submission & meanness, that it is the noblest effort human nature can make, because it is an approach towards divine perfection. (Judge Wilmot.)

Envy empties all her quiver upon ascending merit & nothing turns the arrows so surely as an humble & affable deportment. (the same.)

Matter is capable of assuming an infinite variety of forms, solid, fluid and gaseous. These all appear to arise from different modifications of matter. May not all these changes arise from the modifications of one specific kind of matter only.

A woman nowadays seems only to be considered as a medium of conveyance of a sum of money from a father to a husband—or as a plaything.

Dr. Davies continues taking what has called the *grain pills* with evident advantage. Pulv. Ipec.
Pulv. Rhe
Pulv. Aloes bar.
Hydragyri
Sap; Hisp. 1821.

1819. The average of every hundred of cheese made in this Parish (Berkley) costs the farmer one pound four shillings exclusive of house-keeping for the family, that is, his own immediate family. Servants go into the general account. There should be at least one servant to ten cows, if the business of the dairy is expected to go on well.

A sincere acquiesence in the dispensations of Providence will check discomposure of mind beyond anything. It will produce a calm in the midst of a storm.

A fine impression of the coin of Alectus has been brought me from the Roman cemetery at Wick. Alectus was the friend of Carausius, who usurped the government of Britian in the reign of Dioclesian. Alectus murdered Carausius & was Emperor of Britian about one year. Diosclesian sent a force against him & he was slain on the banks of the Severn.

Thirty-nine years ago the small-pox was brought into Cheltenham from Gloucester by some soldiers who were removed on account of the Assizes. It did not cease for more than fourteen months—a vast number died in the circumjacent villages. Innoculation did not stop its progress. (1808.)

W. B. in the Medical Observer for the present month (Aug. 1808) has given a print exhibiting four heads diseased by vaccination. How easily he might have added a fifth by giving his own.

1823

It will be seen by my early paper of instructions published about twenty years since that I notice a manifest effect produced on the brain about the 3rd day after the insertion of the virus, that is to say, if in that space of time a vesicle is discernable & this is certainly the case. This is the first alarm the constitution feels & commonly the only one when the disease makes it's progress correctly. The chain of processes in the constitution wct. follow, whatever they may be, pass silently on & give no evidence of thier presence.

That such a practice of such universal application as vaccination should be abused cannot excite wonder. It has to contend with prejudice, carelessness, & above all by ignorance—It is expected never to fail. There are some blighted ears in the finest cornfield.

1821

Satisfactory interview with Mr. Croome of Bambury respecting the state of vaccination in that town. Convinced by experience of the Herpetic Influence. I consider chicken pox as the next removed from small pox and though like smallpox in some of it's appearances, yet it has no influence over the constitution in obviating infection.

Sept. 17, 1821.

What instance has occurred to throw a real slur on vaccination. I pledged myself to this point. I could not possibly go further; "That in every instance it would afford security equal to the small pox inoculation if the *rules* I had laid down were strictly *observ'd.*"

Among the vulgar, the great & the little vulgar, nothing is recounted or recorded of vaccination but it's imperfections. It's benefits pass by and are forgotten.

The edges of the wounded skin seem to be the parts most susceptible of the vacine infection.

June 29, 1809. Mr. Fry informed me that he repeatedly vacinated a child without effect, whose mother went through the small pox while pregnant with it in an early state of her pregnancy.

Vaccination has to contend with more ignorance than any other process the faculty are engag'd to attend to & in some instances for this reason, if a failure take place, the Vaccinist is shielded by declaring it is Vacination itself that is imperfect & and no fault in his conducting the process.

If Vaccination ever fails, it must be owing to some peculiarity in the constitution, heedlessness in the practioner, or inattention in the patient.

1819

The generation which has risen up since the small pox has made so near an approach to extinction in this part of the Empire, of course, know nothing of its ravages & consequently are heedless of giving protection to their children. They hear you speak of the disease & hear you forewarn them of their danger, but as the proofs which come home to thier sense are wanting, they exercise that conceit wct. is so predominant in the lower orders of society & listen to you with doubt and suspicion.

I know not how strong malice might make a few failures in vaccination appear, but surely in reason, it must be very weak—I consider the Variolous & the Vaccine disease to be radically the same. As the inoculation of the former has been known to fail in instances so numerous, it would be very extraordinary if the latter sho'd always be exempt from failure. Indeed it would tend to invalidate my early doctrine of the identity of the two diseases. I do not imagine that any-one ever had the small pox, that is to say in the ordinary way, after having the cow-pox correctly, or the small pox after the small pox correctly. By correctly, I mean, in such a way as to produce that change in the state of the constitution or in the skin wct. nature requires to afford protection against the effect of future contagion.

CHELTENHAM SMALL-POX, 1809

In round numbers say that 7500 were vaccinated in Cheltenham & the neighborhood. Out of this number during the late epidemic three took the smallpox. Say 500 remained unvacinated. Suppose then that the whole had been vaccinated, does it not follow that there w'd have been no epidemic at all? For if the exposure had been general, under such circumstances, four only would have taken the infection.

Mar. 9, 1810. Mr. Hands reported that his father had inform'd him that some years ago that he had brought a child into the world with the small pox upon it.

The countless millions that people the earth will be benefited by vaccination.

In the year 1796, 3540 individuals died of the small-pox in London within the bills of mortality.

The mother of the late Mr. Hayward of Quedzley died of the small pox at the age of 70 after being secured, as she supposed, by inoculation. (Mr. Langharne)

The population of Russia, 33,000,000. Of those 2,200,000 are liable to receive the small-pox & of this number the average deaths will amount to 440,000. The value of these individuals to the state is 25 roubles, occasioning a loss of 11,000,000 roubles annually.

Vaccine & Variolous postules on the same skin.

Vaccination will never be fix'd on a solid foundation, till it's affinity with Herpes is better understood.

There is always some drawback—something to operate against perfection in all human inventions. This, among other things, applies to the vaccine.

Dec. 15, 1810. Received this day a very satisfactory letter from Professor Thompson of Edinburgh respecting the epidemic eruption, which has been so fully described by himself & the chief medical men of that city. Dr. Thompson concludes thus; "Deeply impress'd as I have ever been with the inestimable value of your discovery, I cannot conclude this letter without congratulating you on this second triumph of vaccination over the most loathsome & fatal of all human maladies after the test to which it has been lately subjected by the general prevalence of epidemical small-pox."

July 2, 1813. The debate of yesterday appeared in the paper of today on Lord Boringdon's Bill for preventing the spread of the small-pox. Lord Ellenborough makes an insiduous speech, in which he betrays his ignorance on the subject. He praises & condemns the practice in the same breath. The Lord Chancellor declares the evils might be remedied by the common law of the land. Every person introducing the small pox is liable to prosecution.

From the year 1762 to 1792, the number that died of the small-pox in the Danish Dominions amounted to 9728. About the year 1802, vaccination was first introduced & the practice became general, but not universal. However, 58 persons only died of the small-pox to the year 1810. Vaccination, by command of the King, was now universally adopted & small-pox innoculation prohibited, & from the year 1810 to 1819, not a single case of small pox has occurred.

Every man, whose eye is not dimmed by prejudice must now see from the mass of evidence before him the perfection and immense utility of the Vaccine discovery. The man who does not henceforward adjure variolation & adopt exclusively Vaccination is driven to this dilemma. He must confess himself to be either a rogue or a fool.

One curious interesting trait in vaccination is what every observer of its progress must have witnessed, that every thing has work'd together for it's good. The opponents have been greater instruments in facilitating it's progress than it's promoters, by calling up inquiry which has always ended in full proofs of it's efficacy.

TREES AND CORALS

Jan. 6, 1821. Rec'd an interesting account of the state of vaccination in Ebley and the surrounding parishes from Mr. Rob't. Davies.

Rec'd interesting letters & papers from Dr. Labeth, the chief conductor of vaccination in Dublin. He recollects receiving my instructions many years ago respecting eruptions coincident with vaccination & from long observation is convinced of the truth of my remarks on this subject.

Apr. 1821. Letter from Mr. Creaser—very satisfactory with regard to the cause of varioloids.

Vaccination has been universally practis'd thro' this country, yet very imperfectly understood.

There is a history belonging to this world, wct. Providence has not yet disclosed & probably never will be made known to man during his abode here. The "wreck of matter" wct. everywhere presents to the eye tells us that the Globe has been thrown into ruins since it's submersion, but when or how this came to pass is among the Arcana of the Almighty.

The enthusiastic methodist caricatures the most awful & sublime subject that ever was presented to the eye of man, Religion. He strips her of her white robes and dresses her in sables.

To prescribe the workings of the fancy w'd in many cases be to arrest the progress of science.

"The luminous gas wct. appears in the distillation of coal is a compound of several aeriform fluids containing sulphurated hydrogen—carbonic acid—and olefrant gas, but consisting principally of an inflamable gas formed by a peculiar combination of hydrogen & carbon." Med. Rej. v. 1. p. 318.

We should ever have in remembrance the narrow boundry of human knowledge—"We know in part and we see in part."

I have often observed that there is a regular alternation of good & evil in the lot of man, so that a favorable incident may be considered as the harbinger of an unfavorable one and vice versa.

HINTON WORKHOUSE

Sam'l Williams, Master, has a guinea a week to find himself. A. B. reports that he lives on the provisions appropriated for the use of the poor. The house is extremely filthy & full of vermin. Stench intolerable. Covering of the beds insufficient. One family, who sleep four in a bed, have no covering but a single sheet and an old bag.

Pulmonary consumption is certainly contagious, but less so than any disease I know which is contagious.

Human life consists in a series of hopes and expectations wct. can never be realized.

Dec. 4, 1814. Letter from Sir C. Pegge informing me that the degree of Doctor of Medicine has been unanimously conferred upon me by the University of Oxford by Diploma in convocation without one dissentient voice. This is the more honorary as I understand they consider this gift so precious that it is not bestowed twice in a century. E. J.

Dec. 14. Went to Oxford, accompanied by Dr. Baron.

15th. (At Oxford) Received my diploma of Doctor of Medicine of the University of Oxford from the hands of Sir Christopher Pegge, Regius Professor of Medicine. Afterwards presented to the Vice Chancellor, the Professors, Proctors, etc., etc. Visited several of the colleges. Dined with Sir C. Pegge, who gave a dinner on the occasion. Met the Vice Chancellor (Dr. Cole) & the following gentlemen—

16. Returned from Oxford with Dr. Baron.

Mar. 1814. Introduced to Count Orloff by his Physician Dr. Meyer. The Count has promised to send me some Siberian fossils.

15th. Dr. Hamel from St. Petersburg came here. He is a Don Cossack, and a very interesting young man.

Friday, 15th Sept. 1809. Went to Gloucester with Lord Berkley to visit his R. H. the Duke of Sussex. Spasm; Asthma, opium & ipecac.

17. Visited his R. H. The Duke of Sussex at the Castle where he arrived this day.

27th. Sept. His R. H. The Duke of Sussex left the Castle this day much improved in his health, indeed with scarcely a symptom of asthma remaining. He has been having a grain of epecacuani two or three times a day and occasionally the extract Colocynth comp; He smokes three or four pipes of Turkish tobacco daily.

Tuesday, 3rd Octr. 1809. Went to Gloucester and took the oaths usually administered on my admission as a Justice of the Peace. (My nephew the Rev. Mr. Davies accompanied me to Gloucester and took the oaths at the same time as a Justice of the Peace.)

One endeavors to guard his constitution from harm by eating vegetable food and drinking water. Another tries to support it with animal food and wine. Another endeavors to harden himself against the effects by exposing himself to all winds and weathers & another sedulously screens himself even from a breeze by shutting himself up in warm chambers; but in spite of precautions, the fact seems to be this. If we shut one door against the inroad of disease, another flies open.

In order to facilitate the inquiry into the cause of the fatal tendency of pulmonary complaints at the present time, we sho'd first inquire into the habits of our fore fathers with regard to their mode of living & exposure to cold air.

We are in want of the guidance of more steady light than we at present possess to enable us to discern the morbid changes of the human structure. We can only judge of a disease by it's symptoms & these frequently mislead and bewilder us.

Mr. Jos. Bromedge increased my stock of Falfield fossils.

Perfection belongs to the permanent works of the creation only. The order of movement in the heavenly bodies—is permanent, because they endure forever. The constitution of man, his mind, his body, never attain perfection because the whole is perpetually undergoing mutations & finally become dissolved.

Taste is progressive. The time will come when a well-bred woman will no more think of showing herself dressed in colors that do not harmonize than she would think of speaking or writing ungramatically. At present this subject is too little attended to, especially in what is called the ornamental part of dress.

A. B. perpetually talks, even in his ordinary conversation, in a disputatious style. To differ from him in his sentiments, on any subject whatever, is to quarrel with him without nice management.

May 1, 1820. Mr. Fewster reported a case of mania in a young woman speedily cured by the use of Tart. Emetic on the skin.

Few women, excepting such as work and fare hardly, are quite free from hysteric disorders & several then also, who lead a sedentary life & study hard, are affected the same. Sydenham.

To take her from a house, where she has liv'd independently for such a number of years & placed entirely with regard to every shilling she wanted at the control of her husband.

The constitution will overlook little errors, if they are not too often repeated, in eating, drinking, etc.

CORAL

Is not man a coral. Every animal is made from fluid materials, i.e., the blood or modifications of the blood. 2. Do not the fluids themselves constitute the animal? The shells or incrustations forming the solid parts are conveniences fashioned for their use. The woody parts of vegetables are to be considered as analogous to the shells of animals & under this term, I conclude what is called the solids.

DELIRIUM

An irregular & unnatural connection between mind and body.

Nature has contrived matters that nothing can possibly be finally wasted; what appears to be thrown away must come forth for some useful purpose at one time or other.

Mackintosh disputing with Dr. Parr insisted on it there could not be a worse man than Muir. Dr. Parr in reply "He is an Irishman sir, he might have been a Scotchman; he is a priest sir, he might have been a lawyer; he is a martyr to his political principles; he might have been an Apostate, sir.

Monday, Oct. 5, 1808. Agreed with Mr. Simmonds to take the Barley close at 4 pds per acre.

The highest powers in our nature are our sense of moral excellence. The principle of reason & reflection, benevolence to our fellow creatures & our love of the Divine Being.

Nov. 4, 1808. Rec'd a visit from Campbell, the poet.

In every age & every country the malignant spirit of envy has been known to haunt illustrious characters.

The late Dr. Snowden took annually the immense quantity of twenty gallons and six pints of ether. His bill with Corbyn for this article was £49-5-0 per annum.

How many pine and languish for those necessaries wct. the rich man turns into a curse.

Whitehall. The site of this long lost place is at length discovered. It stood where the cottages now stand near Edward Clarke's. These cottages are still called Whitehall. (Answer to W. Shrapnell's question.)

I. E. of F. like many of the Psuedo Professors of our art has gain'd the most of his credit & and not a little wealth by practising enigmatically or clouding the eyes of his patients by throwing plain truths into mystery.

If a Catholic peer, as it has been said, does not regard an oath made by an heretic, why does he not boldly enter the House of Peers, take the oath & his seat? The answer is clear, his conscience keeps him out, and thus this objection is answered.

It was Boerhaave, I believe, who first said, "The sparks of calumny will be extinct of themselves, unless you blow them." Music and gardening were Boerhaave's constant amusements.

Instinct and reason are constantly waging war with each other.

Man, according to divine writ, was the last being which the Almighty created. He was made from the earth in common with all other living things, but in what manner he was fashioned does not appear. It might be by slow degrees he attained the form and various component parts in which he now appears. The term *day* according to the present translation, admits of being changed, as many persons highly versed in the Hebrew language allow, into period. The manner in which we see the Hydatid call'd into existence in the human body precludes nearly the possibility of it's coming from an egg. May not the hydatid have been the original animal & tho' nature does not allow of the species being multiplied in their present state but according to fix't laws, yet the hydatid, which appears to be little more than a perfect stomach may be called into existence like the scion or offsets of the vegetable.

It will be better for us when we know more of the vital mechanism of the human frame. We seem to know a great deal, tho' in reality but little. The lymphatics appear hitherto to be considered as mere tubes destined to carry the chyle into the blood vessels to be perfected into the blood for the purpose of secreting the waste of the body. But is this all? I consider the lymphatics system as the most important of all in the complex machine & that to wct. every other part is subservient.

24, April, 1813. Frosty morning. Snow storm at 12 oclock. Wind East.

Sat. 25, Frost severe for the season. Snow and sleet during the day.

June 1. Went to Stone. Dined with the Wolfershans. Went to the Rock at Woodford and found several good specimens. Adjusted some majisteral matters with Mr. Davies.

Among that class of medicines termed anti-dyspectic the alkalis are probably at the head & among these, the liquor potassea seems to claim the highest post. Its control over strumous affections is often very evident; & if, as I suppose, the stomach and intestines are the first links of the long chain of absorbents, we shall perceive the cause of the influence this medicine exerts upon these diseases.

The student in geology scarcely passes the threshold of his enquiry before he finds himself in a bewildered country. The Mosiac account of the Deluge on one side & the order in wct. he finds the *mineral cabinets* arranged by the hand of nature on the other: of Him who created the Universe entangle him in perplexities.

"The Religion of this country had God for its author—salvation for it's end & Truth without any mixture of error for it's subject and maker." J. Locke.

"Nature may be contemplated as one great image of Divine benignity." Campbell.

There are secrets going on in the animal economy which the keenest penetration of man may never be able to disclose.

Why does blueness appear tinting the crimson on the cheeks of those disposed to scrofula?

It has been remarked that there is a relationship between taste & morals—the one is seldom improved without an advantage to the other.

We live in a monarchical government—the slaves of Omnipotence.

1788

Jan. 3. Heard a thrush singing.

4th. Robins sing particularly plaintive at the dawn of day and in the evening.

24th. Eggs in the ovarium of the brown owl very considerably advanced.

Feb. 4th. Sparrows begin to use the spring chirp.

7th. Saw ten white wagtails together over a puddle catching gnats.

17th. Saw frogs spawn. Frogs appear remarkably late, tho' the season has been very mild.

Stood Godfather to Mr. Hickes' son Thomas, April 17, 1806.

Nov. 3, 1810. Rec'd from Sir C. Morgan his work on———Observed that he has drawn largely on my scanty papers without the least acknowledgement.

1814

M. Cuvier has described 78 species of fossil bones, 49 of which were certainly unknown to naturalists & 16 or 18 are still doubtful.

It appears to him, from facts which he has established, that the earth has undergone several great & sudden revolutions, the last of wct., nor more remote than 5 or 6000 years destroyed the country at that time inhabited by the species of animals existing & offered for a habitation to the feeble remains of these species continents which had already been inhabited by other beings wct. a preceeding revolution had buried and wct. appeared in their actual state at the time of the last revolution. Cuvier's Memo Mss. in 4 vols. (plates).

What are we? Realities or phantoms? Whether one or the other, we are called into existence or imaginary existence by invisible or unknown agency. Ourselves in the center, we see that agency in everything around us. We see Wisdom displayed to the utmost limits of our comprehension & in numerous instances far beyond it. Tho' doomed by an immeasurable distance, let us follow & humbly imitate the grand, the great First Cause.

Eruptions of any kind appearing on

dogs during the progress of the distemper relieve it.

1813

Subscriptions & contributions annually. Bible Society, Bloomsbury Dispensary, Cheltenham Dispensary, Society for the relief of Foreigners in distress, Cheltenham Club, Plough—Dr. Fleece, Alfred, Royal Institution, Cheltenham Chapel, Clergy Charity, Philanthropic Society, Fever Institution, Glouchestershire Society, Gloucestershire Infirmary, Berkley School of Industry, etc.

It is not an universal law that diseases of the stomach affect the head & that those of the head affect the stomach. When W- destroyed himself by taking nearly half an ounce of arsenic, his head was free from pain and the intellect clear during the eleven hours of his existence from the time he received it into his stomach till be expired.

However, we may lament the existence of such a principle it too often happens that malevolence has a memory more extensive and a louder tongue than gratitude.

Why should not the principle of life be as much connected or even more connected with our fluids than those parts of the body we call the solids?

FROM THE LIFE OF SIR ISAAC NEWTON

Notwithstanding the extraordinary honors that were paid him, he had so humble an opinion of himself that he had no relish of the applause wct. was so deservedly paid him; & he was so little vain "desirous of glory from any of his works, that he, as it is well known, would have let others run away with the glory of those inventions, wct. have done so much honor to human nature, if his friends and countrymen had not been more jealous than he, of his and their glory."

In Germany, on the Rhine, they do not cut their grapes for wine, until they have had a little frost, hock, Mosselle etc. are thus produced.

When Thou sitteth to eat with a Ruler, consider diligently what is before thee & put a knife to thy throat, if thou be a man given to appetite. Be not desirous of his dainties for they are deceitful meat. Solomon.

Many of the Diseases of the Esophagus, stomach & intestines are to be considered as the diseases of the primary lymphatics.

2. With few exceptions, do not all medicines by their action on the human body, either increase or intercept the determination of blood to particular parts, or preserve or tend to restore an equable circulation.

Nov. 14, 1810. Received from Berkley the mournful intelligence of the death of my beloved sister, Mrs. Black, who expired suddenly on the 13th, in her 80th year.

There is a fact wct. experience has taught me respecting the application of blistering wct. is worth recording: The effect on the skin seems to be in proportion to the thickness of the plaster laid upon the leather. For example, if it be very thin, it will act as a rubifacient only—if of the usual thickness, a blister will be raised in about 24 hours; but if it be spread of three times the usual thickness a blister will be raised within 12 hours & a purulent discharge will follow for a week or more. In the latter case, it is a kind of semicaustic. The reason why there sh'd be this modification seems obvious. The cantharides immediately in contact with the skin soon produce all the active effect they are capable of producing; when the next stratum begins to produce it's effect. Thus, with a plaster thinly spread, the stimulus soon ceases, but when the strata are multiplied, as in the plaster spread thick, the succession of active particles continues till the surface of cutis is thrown into such a state as to bring on suppuration.

Dissolve one ounce of blue vitrol in a quart of water. Put one tablespoonful of the solution to the milk of 18 or 20 cows after the rennant is put in and mix it very well with the milk.

Mr. Wells of Dussley brought me a good specimen of *Wavellite* from a rock at Bray in Devon so called from Dr. Wavell, who first brought it into notice. I have long suspected that all the varieties (if there be varieties) of these ites are of coralline origin & these specimens which are imbedded in rock similar to our Woodford Trap, seem such as———to assure me my suspicions are well founded —communicated to Professor———at Cambridge, thro' Hart, Kingscote.

A. B. is touched hard by
"the withering blight"
That sin & sorrow leave, where'er they light.

To Wm. D. Reccollect what we have often heard me say, it is at the commencement that diseases are to be removed—Procrastination in these matters often produces irremediable consequences.

WOTTEN-UNDEREDGE

There seems to be a natural instability in the air of the whole district, but particularly in the unventilated valleys and ravines surrounding some parts of the town.

Locke has advanced that whoever hopes to employ any part of his time with efficacy & vigour must allow some of it to pass in trifles.

Davy supposes that water may be a simple body in one electrical state constituting hydrogen, & when in equilibrium with regard to these states appearing as water, & that there is only one ponderable matter, the base of these as well as to some other chemical substances. *Lond. Med. Rev.*

In order to facilitate the inquiry into the cause of the fatal tendency of pulmonary complaints at the present time, we sh'd inquire into the habits of our forefathers with regard to their mode of living and exposure to cold air.

The intention of Sunday schools, schools of industry and the like, is to impart instruction on the greatest & the least of all mental endowments—Religion & the lowest order of domestic economy. An early knowledge of God cannot be too strongly impressed on the growing mind. It will be so incorporated as never to be eradicated. It may be enfeebled by those temptations wct. rush into the youthful mind & perhaps there may be instances where it's operations may for a while be quite suspended; but in the hour of adversity, which sooner or later all must feel, it will recur. Then will it take fresh root & shoot again with vigour & in the hour of sadness especially if poverty sho'd add its weight to the load of wretchedness, is there anything can render such soothing consolations as divine contemplations.

The air we respire must always contain a certain & not an inconsiderable portion of that air wct. has already passed from the atmosphere into the lungs & been breathed as the trachea & it's larger ramifications must still remain full of it after every expiration. Thus nature contrives to mingle with the atmospheric air, consisting of oxygen and nitrogen.

Equal quantities of Emp. Dyach. & Ung. Hyd. mit. melted slowly together make a plaster of a good consistence. 2nd. Would not this form a good application to indurated tumors. It is admirable as an application to herpetic sores.

The effusion of serous fluids wct. appear first above the ankles in diseased constitutions, arises probably in parts near the viscus inflam'd & gravitates from the part to that most dependent. It has long struck me as a species of spontaneous bleeding to relieve that part inflam'd. Not only serous fluid is thus discharged, but sometimes coagulable lymph. We find it mixed with the serum in Hydrops Pectoris.

I married a wife on Monday,
We fell out on Tuesday,
I bought a stick on Wednesday,
To beat my wife on Thursday.
Died she did on Friday—
And all my delight on Saturday night,
To bury my wife on Sunday.

INFLAMED EYELIDS

Sponge and warm water every morning.

In recommending the use of the ointment to act upon the skin, it will be seen that I relinquish all claim to originality. But I found it limited within a boundary too narrow to extend it's use & make known by the exhibition of new facts it's utility in some of the most refractory diseases was my chief aim in sending this pamphlet into the world. And further to shew by this edition that many of the suggestions respecting it's use in checking the progress in acute diseases have been verified.

The bird has a succession of nests for the succession of progeny (Notes on the hum: uterus.)

Apr. 10, 1809. First heard the Black cap and the call of the green Tinnet.

Lord Bacon complains of biographical literature of his day. He says that actions both great and small, public & private, sho'd be so blended together as to secure that genuine nature & lively representation, which forms the peculiar excellence & use of biography.

The use of the ligatures for securing divided arteries, the thought of Pare, was opposed by the Fabrica & the horrid method of crisping them up by hot irons was revived. Query—did not Mosely & his followers attempt to play the part of the Fabricii?

CONTAGION

Contact only seems capable of communicating what we consider as contagious, i.e., effluvia must consist of particles tho' invisible & these particles must form a line of contact.

The conduct of———must appear odious in the sight of God & shameful in the sight of man. Those who are ignorant of the arts of servility & falsehood are not the most welcome guests at the———

Beddoes complained more in sorrow than in anger of the want of zeal among his fellow practioners for the improvement of medicine & of their placid acquiscence in a neutral system of practice & their indeviating perseverance in the beaten tract, instead of giving the influence of thier example & correct tone of thinking upon medical subjects, as should reciprocally stimulate the minds of both patients and physicians. Life of Dr. Beddoes by Dr. Stock.

Do not all human actions spring from one source, a desire to please oneself. This desire is constantly uppermost in the human mind & thence arises the perpetual struggle between inclination & prudence. The latter in a well regulated mind keeps the former in check.

EXTRACT FROM A LETTER SENT TO DR. W. JUNE 16, 1821

The same monotony that is to be found in every sequestered village in England, is to be found here among the locomotive corals; very little variety is to be found. The fixtures shine in all thier lustre & passing down in the scale, attract by thier simplicity. Nature's primitive buildings are all constructed on the same plan. What we designate by the term *Coral* is as perfect as the man as far as regards the substantial part of the building. All that we see is shell or analogous to shell; fluids as well as solids. The vital principle is in the interior of the cabinet under the lock of the Deity. When this escapes, as once the structural parts falls into dilapidation & is carried particle by particle, by agencies visible & invisible, thro' all the regions of fire, air, earth, water & in the course of time lends their assistance in the building of new mansions & rebuilding or rather repairing of the old.

The stomach has four distinct offices to perform, nervous, muscular, the secretion of mucus, & the secretion of gastric fluids.

Let peach trees be nailed just as their blossoms begin to appear if the weather be wet or if it be frosty & suspend by lines of list by means of strong nails. As soon as they are out of danger, they may again be fixed in the usual way.

All medical facts begin in theory, unless stumbled upon by accident. Theory is the bud and fact the fruit.

When the stomach becomes affected with dypspepsia it often happens that the heart is disposed to lose it's regular motions & to palpitate. This cannot arise in any direct communication from the stomach to the heart, but must arise circuitously thro' the influence of the brain.

SICK HEADACHE

It has been a question whether this be an affection arising from the state of the stomach itself, or from that of the head. It may be both, that is, it may originate in the stomach & by exciting pressure within the head, the diseases of the stomach may be kept up. So that the first cause may excite a secondary cause which may keep up the same train of symptoms.

Fig tree not to be pruned before May or June. Barberries to be cut down to two or three feet.

The vines were planted in the hot-house by Mr. Gold, June 9, 1818.

I scarcely know a rational man in B. But H—. Has vice ever demonstrated to her profligate votaries, that she could communicate happiness. Those, who pursue her pleasures act upon *trust* and they are *always* deceived. The principles of the man of virtue are founded upon a solid basis, therefore he is *never* deceived. Every rationality must confess of course that he relinquishes his reason, if he do not act in conformity to the dictates of the latter.

We are mistaken if we suppose that the stomach is the grand sufferer among the vital organs of the drunkard. No, it is the brain. Whoever will consider the phenomena will soon be convinced of this & from these phenomena may be deduced the crumbling down of the constitution by the dilapidation of vital organs.

The human body, an immense laboratory, divided and subdivided into ten thousand compartments, the chief of which is the glandular system.

Has not many a one died from the application of a blistering plaster; but still it is as much in use as if this had never happened.

Rational theory is like that kind of circumstantial evidence before a Court, wct. has strength sufficient to convict a culprit or acquit him.

Without the agency of the brain, the whole machinery of life stands still. It may approach very near to a stop, and yet be set going again, as in hysteria.

I want to do away the whole stomach pathology at a sweep & to place the brain upon the top of the lofty pedestal allotted for it. To show it as exercising complete sovereignty over every vital atom that forms the human frame.

Some folks tongues are like race horses —the less they carry, the faster they run.

It is not the man who invented cannon or the powder, or the shot, that does the execution, "but he who points and fires the gun."

Upwards of 4000 numbers of the Gentleman's Magazine are published monthly; on a computation these must meet eight times the number of eyes.

Nothing is more impossible than to make men comprehend or allow any distinctions which weigh against thier desires.

June 2, 1809. Dissected a cow at Lord Berkley's kennel that died this morning of the *Red Water*. The principle disease appeared upon the heart & pericardium. The heart was inflamed, the inflamation extended nearly over the whole surface. No inflamation appeared on the internal surface of the pericardium, but the—

Fools are more hard to conquer than persuade.

Extract of a letter from Mr. Fry, Surgeon, at Dussley, Gloucestershire, Oct. 3, 1820.

A Visit this day to the family of Henry Brothers of this town, carpenter, would, I think, convince the most prejudiced of the protecting power of vaccination. Brothers has nine children, the eldest 24 years of age & eight others in regular succession. The eldest William had the small-pox from innoculation 23 years ago. This fact can be proved by the clearest possible testimony. Happening to go down to Bristol about a month since, this young man caught the small-pox, came home sickened & had a very heavy burden. Thomas, the next brother & also another brother & the two eldest sisters had been vaccinated some years since. They all continued to associate with him & the girls officiated as his nurses. The four next in succession who were never vaccinated are at this moment seriously ill with the small-pox, while the four elder ones, who were vaccinated, are in perfect health, & at this moment nursing the little ones. They had been also previously exposed to the infection of the older brother.

Sequel; One of the young men who took the small-pox died—the other two recovered. The three sisters who had been vaccinated when every young went thro' this fiery ordeal without a spot. About eleven hundred of the poor were then vaccinated at Dussley & at the circumjacent villages & the plague was stayed. Histories of this description are now so common in every part of the globe that they know no boundary, nor will they ever know a boundary while small pox remains upon the earth unless in such districts as through ignorance or heedlessness imperfect vaccination holds out a false security.

Without brain & nerves all corporeal matter inert.

The whole of the corporeal matter wct. constitutes the human fabric, I believe to be entirely enert. What the nervous chords? Yes. It is in my opinion the soul alone that feels & this is totally invisible. It is this which commands the brain itself.

CORPORATION OF BERKLEY 1822

Capt. Berkley.
Mr. D. Martlove.
Mr. Joyner Ellis.
Mr. Geo. Smith.
Dr. Jenner.
Mr. Thos. Neale.
Mr. H. Jenner.
Mr. T. Hickes.
Mr. Norman.
Mr. Th. Woolright.
Mr. Robert Jenner.
Mr. Robert Pearce.
Mr. Morgan.

LIQUOR—LITTLE INFERIOR TO NOYENS

1 quart common gin.
The rind of a lemon.
¼ oz. of cinnamon bruised.
12 oz. of bitter almonds blanched and powdered.
12 oz. of fine sugar compound.

Then let it stand for three weeks, now & then giving it a shake—then strain it through a cloth—when fine—bottle it.

FROM THE TALES OF MY LANDLORD, CONTIN'D

Reader—This tale will not be told in vain, if it shall be found to illustrate the great truth, that guilt, tho' it may attain temporal splendor can never confer real happiness; that the evil consequences of our crimes long survive their commission, and, like the ghosts of the murdered forever haunt the steps of the malefactor & that the paths of virtue, tho' seldom those of worldly greatness, are always those of pleasantness and peace.

GARDENING, 1818

Farmer Dimmery a man of acute observation was much struck with an occurrence in the garden of a neighboring farmer, who was a sloven. He had occasion to extend his garden & to take in a court wct. was pitched. Too lazy to take up the pitching, he covered it with garden mould about two feet thick. But it turned out that this portion of the garden was far more productive & produced better and earlier vegetables than any other part of the garden. Soon after, in a ploughed field, he observed a part, wct. had been a well stoned road about a hundred yards long. The superior verdure and strength of the corn growing there showed to an inch the line of this old road. From these appearances he took a useful hint & set about what he called *planking* some of his own lands. That is, by throwing off about two feet of the surface & giving the surface thus exposed a good covering of stone then returning the mould thrown off. A considerable portion of his lands has been under this treatment for some years, and it's beneficial effects are very conspiuous. His son has a small dairy farm in this Parish (Berkley) Hogsdown—was remarkably unlucky with his cows. He lost several, all the rest were tender & sickly. Conceiving it might be owing to the unwholesomeness of the water from the ponds, rendered so by their frequently going into them while drinking, dunging there & passing their urine also, he determined to try the effect of water fresh from pumps, some of these were so placed that a few answered the purpose & the cattle drank clear water from cisterns. The plan has succeeded admirably. His cows are never sick, & their milk is far more abundant in quantity & of a better quality. Previously to this, they were very apt to warp, but this occurrence, so embarassing to a dairy farmer, has also ceased. Farmer Dimmery from this mode of planking potatoes got 380 bushels from an acre.

COTTAGE CREAM

A teacupful of white wine—a little sugar, half a nutmeg grated. Put this at a bottom of a trifle dish & add a tablespoon full of sennet. Pour on a quart of new milk warm from the cow. Let it stand three or four hours.

STRONG CEMENT, SCARCELY INFERIOR TO STONE

Lime well slacked, sand. Temper it with linseed oil to the consistency of mortar. Beat it well on a floor or a trough & then spread it on a dry wall. It will last for ages.

STUCCO

Lime Hx. Water Hx. Coarse Sand H S. 4. Grated skimmed cheese H IV. To be worked together & used soon as possible. The bricks to be quite dry on wct. it is laid.

As almost all adult human beings are constantly endeavoring to mend their own condition at the expense of their neighbors, the love of fame & the love of riches are the two great sources of the generality of mischief & wise man has confined this observation to one of them only, Hence wars.

Nov. 2, 1809. Rec'd the books of the Geological Society of London & a letter acquainting me that I was an honorary member.

Vive et Vivas. The motto of my ancestors, the Davies's of Moorend (Slimbridge).

July 2, 1817. Violent hurricane in the night & early part of the morning from the S. W.

We must restrain the enterprizes of fancy & admit to be true not what we presume, but what we find to be so. The *a priori* spirit is presumptous . . . The science of mind as well as matter must be brought under the entire dominion of the inductive philosophy.

In Cornwall and some parts of Ireland, the granite is coarse grained & splits into immense blocks, separated from each other by natural seams & appearing like the ruins of edifices constructed by a giant race.—Brande.

N. B. This description gives the appearance of the masses found in a field of Farmer Barbers at Fort Worth.

Every man in his personal capacity may indeed he must, do wrong, for error is essential to humanity. Boyd.

Pain is nature's monitor & contributory to the wellfare of the sufferer to teaching it to avoid what is injurious.

6. Volcanic.
5. Subordinate
4. Alluvial clay—gravel.
3. Hoelz—or secondary rocks,
2. Transition strata.*
1. Original crust—primitive rocks.

There is a mountain in Thibet (Dwawalagin) 26,862 above the level of the ocean. This is about 6000 feet higher than Chimborasco, 1100 feet higher than Mont Blanc & 2200 feet higher than the most elevated peak in the British Dominion & wct. indeed makes Ben Nevis very insignificant.

*Rocks made out of older matter possessing organic remains.

Rebuke a wise man & he will love thee.

The several vital functions were the result of the actions of a principle distinct from organization in wct. it is held. J. Hunter.

The red sandstone forms a large portion of the surface of Cheshire & the Northern half of Shropshire. It contains no organic remains.

The exaltation of an equal excites universal envy—in many instances, even hatred.

Humility is more an assumed than the real character of the House of H- & were that house possessed of power it would be fully exercised.

There is a supergurgevcence in I.C.H. which enables him to mount above those distresses, which have ever assailed him.

Admonition has the greatest effect when well managed praise is mingled with censure.

ARMS OF JENOUR

Kenelem Jenour of Much Dunmore in the County of Essex, Esq. Azure, a cross valie between three fleur de lis, or Created a Baronet by Charles the First on July 30, 1628.

The trifling difference from the arms now in use Glostershire denotes another branch of the same family.

Vaccination has made such progress at Amsterdam that out of a population of 200,000 souls, in the first quarter of 1817, not one individual was attacked with small pox. (Globe, Aug. 24, 1817.)

In proportion to the deviations of man from that simplicity which is found in the plain humble walks of life, so increase his disquietudes.

Hilariter-secleriter. Heltar-skelter.

TEARS

There are no faces truer than those that are so washed. Shak.

Why should we wonder at the changes that take place in mind and body during the vicisitudes of the seasons & the transitions in the weather even in the space of a single day? We should consider that the very springs of life itself are in the atmosphere.

Pure simple hysteria at the onset, frequently a mere passion, an affection from some emotion of the mind. So loosely connected indeed is it with the vital powers, that it may, in many instances, be controlled and even subdued by the mere effort of the will.

The human body is not only a living machine, but it is a life-making machine.

Chain coral not a thing of itself, but a part of the formation of another coral.

The Ecton copper mine in Shaffordshire is worked at the depth of 472 yards; it is the deepest in England. The deepest in Europe is one at Trullenburg, in Bohemia, which is a thousand yards below the surface.

Prejudice has neither eye nor ear.

Religion ought to be the silent paśsing interchange between the individual & the Deity, without form or ostentation.

A century ago, the atmospheric air was considered as a simple element; water was considered so too. The march of chemical knowledge has lately been very rapid and has shown us that these notions were erroneous, as they can to a demonstration be themselves divided into distinct elements. But what are these elements? We see that we have no more right to consider them as simple bodies than the substances wct. contained them. Men & quadrupeds inhale into the lungs the air of the atmosphere instantly, a chemical process takes place, established by a law from the Almighty. Unions & decompositions are the consequence & many a secret in this secret laboratory wct. never in human probability may meet the eye of man.

The farina of potatoes washed once only after grating and mixed with chalk makes a beautiful white wash for ceilings, etc.

Moral & physical laws are often at variance with each other & make sad work in the creation. The one is entered on the statute book of the Deity—the other is the mere edict of the legislature. Boldness often insures success. Indecision is the worst of ills in matters of importance.

There is a constant process of pulling down & building up going forward in the human body. A useless atom is removed and one useful is substituted.

To Dr. W. There is probably about the liver one of those somethings of wct. we know so little, those secret workings, wct. are going on undermining it's structure wct. will be subdued by the use of the blue pills.

My harp is turned to mourning and my organ into the voice of them that weep. Job. Chap. V. 31.

What is the cause of the pain under the left breast in hysteria?

Wood loses about three-fourths of it's weight during it's conversion into charcoal.

Why are we to limit our notions of the agency of canals on substances passing through them to the stomach & intestines only? May not the lymphatics, blood vessels etc. produce changes on their contents during their passage.

May it not be the constant succession of air drawn in by the lungs & distributed by the arteries whc. prevents putrefaction. The more frequently even the surface of dead animal matter is brought in contact with a fresh succession of air, the longer it is preserved, but we cannot apply it to the interior.

Oct. 2, 1817. Rec'd a letter from Dr. Py of Narbonne in France, with an elegant poem in the French language on vaccination.

Mr. Hunter supposes the Vena Porta of the liver to be irritable as it performs the functions of an artery. We know (says Mr. Abernethy) it fails to secret or secretes with profusion—that it sometimes prepares healthy & at others faulty bile.

Hydatids seem to be monsters created by the lymphatics.

All combinations & decompositions are, according to Davy, electrical actions, & what is called electricity pervades everything whether solid or fluid.

Man is nothing more than a little link in the long chain of creation—tho' he is too prone to consider himself a whole.

There is a limit across which man cannot carry anyone of his perceptions & from the ulterior of which he cannot gather a single observation to guide or inform him.

There are lymphatics & compound lymphatics going forward in the human frame—one deranged link may derange a thousand & whether deranged action or deranged organization is to be the consequence is for a while concealed.

To try the uvaurci in cases of morbus mucosus.

Woodford Rock is passing into sandy clay, 1817.

The gases are never found alone or uncombined either in a solid or fluid state, but combined with so much caloric as to give them a gaseous form. No degree of cold is able to condense them into fluids or solids. The air of the atmosphere for example, they are all invisible.

Digestion of food in the stomach and intestines & probably it's passage thro' the mesenterie absorbents & thoracic duct is the first great process for the reanimation of dead matter. The lungs, as the recipients of atmospheric air, finish the business & give complete vitality to the blood & render it fit to supply the waste in vital organs.

Feb. 26, 1817. The medicine Dr. Baron prescribed for me was as follows:

Rx. Potassae Nitratis, ʒi.
Aquae Purae, ℥V.
Spiritus Atheris Nitrici, ʒi.
Tinctura Scilla gut: LX.
Syrupi Limonis, ʒVi.
Sumat unciam unam. sexta, quaque bora.

In Dr. Lobb's treatise on fevers etc. is the following recipe from which Moses Griffith probably took his celebrated preparation of iron.

Rx. Sal; Martii, gr. iv.
Sal; Absinthii gr. xvj.
Aquae Alexitino ℥ij.
Bryonicae Comp. ℥iss.
Sp: Lavend: Comp; ʒij.
Nitri dulc: gut: xx.
Tinct: Myrrhae gut: xxx.
Dosis unum cochlease.

Aug. 1817. On examining the short grass put into the trenches weeks ago, found it but little decompos'd; it was in a state of great moisture & *gave out an odorous exactly similar to cow dung.* Another trench of grass evidently gave the smell of amonia. Query—was this from the insects which perished with it?

VEGETABLES—A. KNIGHT

Imbibe watery fluids from the earth in wct. saline & other matters are suspended in solution. These in the vessels of the vegetable become the sap or nutritious fluid of the plant. This ascends, forms the leaves, flowers & fruit, in wct. it is more particularly expos'd to the influence of light, heat & air. It then returns & augments the woody stems and trunks, impregnates them with juices wct. concrete eventually descends to the roots to nourish & increase them & in various instances to form means & materials for the future production of vegetables of the same kind. It is in the leaf however, that the distributed fluids of the plants seem to undergo their chief elaboration, for here they are more freely exposed to the influence of light, heat & air.

EAU MEDICINAL—FROM MR. HAUSERMAN

8 oz. Colchicum—1 oz. Bryony root. After they have been gathered & lain two or three days to dry, fill a bottle with them without pressing them much & then fill it with brandy, wct. is to stand well cork'd for six months. Press the plants with a strong power, the juice of which mixed with the same brandy is to produce the Eau Medicinale de Husson. Keep it well stopp'd.

GEOLOGY

It is possible that the surface of the earth or more than the mere surface, forming the Berkley District, may by one of those vast convulsions (wct. it is plain at distant periods threw the globe into the utmost disorder) has been covered with materials brought from very distant regions. The shells & corals found in the Rocks of Gibralter are similar to those found in the Rocks of Thornbury, & so are the fragments of some of the stones. The Coral so abundant in a range of many miles was never probably generated in the spot on which it now reposes, nor any of the *Families* of stones wct. lie about the surrounding country. All might have been impelled forward at the same period, driven by the mighty, the irresistible torrents of the great deep, rushing from their subterraneous prisons. That these corals, such as appear from the immense masses in wct. they are heaped together in the visible rocks of Woodford & of Falfield, have been forced from their original positions, seems to admit of demonstration from fragments of these identical corals being found among the Thornbury Brecia. This Brecia consists chiefly of fragments of rocks for the most part had been recently broken from the size of a pretty large block down to microscopic atoms & it appears to be the aggregation of these atoms in contact with the larger stones wct. forms the cement that binds them together. These are not fragments of any rocks that belong now or probably ever did belong to us, but were mingled over an immense space & sent here by one mighty sweep of that powerful element, water. Not only corals & shells are found among this Brecia, but even fragments of Basalt itself. This indeed does not prove the basalt rocks to have moved forward with the general sweep, as these might have been detached & mix'd with other fragments while passing onwards.

CUNNING,

in the progress of human intellect precedes judgments. Exemplified in childhood.

Is there a process in some measure

similar to digestion going foward in the lymphatics when food is injected into the colon & absorbed. One cannot well suppose that the colon itself has the digestive power.

Examples are not wanting to show that deeply seated inflamations of the viscera may exist for a considerable time & even occasion the death of the patient, without ever giving rise to symptoms that enable the medical attendant to detect the real nature of the malady. Pritchard on Fevers.

———A bankrupt in business, in fame and fortune.

There was this difference in ordinary catalepsy & that of A.D. In the former, there is no consciousness. In the latter, the senses were not in the least obscured.

Oct. 9, 1822. Martins killed this morning by G. J. were found to have their stomachs perfectly empty—they were young ones, perfectly plump & the weather being boisterous & stormy, they had not at that early hour the means of procuring food.

Oct. 9. Dissected a swallow killed at midday. It's stomach had abundance of the remains of small scaraboi in it.

10. Oct. Saw a number of small scaraboi picking a bone on the grass in the garden.

Letter from Dr. Waterhouse, Boston, America, with his pamphlet on the pernicious effects of the use of tobacco.

Nov. 29, 1822. The first frost that brought the ducks diving, a sign of rain. Fowls setting upon a stile or gate, a sign of fine weather.

Farmer Dimmery has frequently seen the *Hydatriat* fungi and noticed their luminous appearance when stirred about in the dark.

HARVEY'S VINEGAR

3 spoonfuls of India scoy.
3 spoonfuls of walnut catsup.
Six anchovies.
Two heads of garlic.
Quarter of an ounce cayene peper, less if very strong.
Cochineal sufficient to color it.

Put the above into two quarts of strong vinegar, stir it for a fortnight and then filter it.

Professor Clarke of Cambridge conceives that the appearance of meteors is due to heat & light evolv'd during the transition of a body from the airiform to the solid state—a theory at present wct. is more happily illustrated by the recent experiment of the ignition of a platium wire coil'd around the wick of a spirit lamp, wct. exhibits heat & light for hours after the extinction of the flame of the lamp so long as any of the Alkahol remain. The nature of this phenomenon is thus explained. The Hydrogen of the alkahol combining with the oxygen of the atmosphere forms water, consequently heat is evolved.

How is it that cold acts upon the constitution when applied partially to the skin by means of air, water etc.? We see a variety of injurious consequences, but for the most part affections either of the mucous or serous membranes of an inflammatory kind. Cold, universally applied to the skin, produces no such effects. Cold applied to the stomach acts in a manner nearly similar.

It seems to me that men neither understand the estate they possess, nor their abilities to purchase; but of the one to presume more & of the other less, than indeed they sho'd. So it comes to pass that overprizing the arts receiv'd, they make no further inquiry; or undervaluing themselves, more than in equity they ought, they expend their abilities upon matters of slight consequence, never once making experiment of those things, which conduct to the sum of the business. Wherefore, sciences also have as it were their fatal columes; being then not excited, either out of desire or hope to penetrate further. And seeing the opinion of wealth is one of the chief causes of want & that out of a confidence of what we possess in present, true assistances are despis'd for the future, etc. etc.

There is a strong association between the arteries, veins & lymphatics—they play into each others hands.

All impressions are made upon the brain, whether external or internal—whether the sensitive or irritative—whether correct or morbid. The senses are videts & carry intelligence first to the brain and then to the stomach & various parts of the system. Reflected—sympathy. Caroline Kingscotes' case.

1819

It is now more than twenty years since I first promulgated the results of my experience in inoculating vaccine-matter on the human body & my first publication contained examples of it's antivariolous power so strong and secure that it was soon put to a test here & shortly afterwards on the Continent—2 other publications. E. J.

There are two kinds of inflammatory affections, designated by the terms phlegmonous & erysipelatous, but we must admit a third, the Tubercules. However, it must be observed that Tubercules may exist without inducing inflammatory action on the part where they are placed. They do not act on the surrounding matter as extraneous bodies because they possess life.

Certain fossils are peculiar to & only found in particular strata. England is a regularly stratified country, & the order of it's strata is never inverted—exactly similar fossils are found in distant parts of the same stratrum.

Wm. Phillips, Outline of Geology.

There can be no friendship without confidence and no confidence without integrity.

The geology of England assures us of the truth of this position that *order in regard to deposition is universally prevalent & that this order is never inverted.*
W. Phillips.

Mar. 1818. Vinegar laid on fruit trees with a painters brush is said to destroy the white blight. The Aphis Lanigera.

Mr. Beynton's method of preparing & using the muriate of lime. Take powdered marble & saturate it with undiluted muriatic acid. An adult may take from ʒi to ℥ss in water or milk & water twice a day or even three times. ʒi is a dose for a child of seven years old.

Bones found in the grave pits near Wick. Several fragments of the human skeleton, both adult & infantile. The jaws of a horse or ass—detached molares—the bones thickly enveloped in soil like that of the field independent of gravel. Fragments of urns, some like those at Herculaneum of a dark sooty color. Ashes in considerable quantities. Antiquaries conceive this to have been a Roman Cemetery & that some fire must have been near.

Chain coral not a distinct body. It must be identified with the enchrinite. The heads of the small enchrinites are distinctly to be seen in many of the points of protuberance forming the chains. What an analogy is here with the great alcyonate man. The creation may almost be said to be Zoophitic. God, the centre, animals, vegetables etc. etc. etc. the ramifications, all acting in harmony, forming one great whole. God, the directing principle.

It sho'd be observed that the appearance of chains meandering over a surface is accidental. The heads being partially destroyed, cavities appear wct. existing in elevated lines on the surface, one with the other form the links. But this fossil would never put on this appearance had not the surface undergone another accidental change. The appearance at first—

Safety lamp-disliked by the colliers who go back to the old system and often perish thro' their obstinancy.

Charcoal poultice. Oatmeal & water well boil'd, as much charcoal finely powdered as will make a stiffish poultice. The edge in every poultice sho'd always be as thick as the center—a thing often neglected.

PULMONARY AFFECTIONS.

Hydragyrus.	Nitre.	Hyoscyamus.
Cantharides.	Antimony.	Opium wth. Acids.
v. s.	Aperients.	Nitre.
Leeches.	Opium.	Ammonia.
Cupping.	Poppy.	Squills.
Digitalis.		

DR. BEDDOES' PREPARATION OF IRON

Sulphate of Iron, ℥i. Nitrous acid ʒss-Misce. avoiding fumes, The solution being cold & having the consistence of honey, add to it, Viij of distilled water. The whole is then to be filtered, &, after having stood two or three days, filter it again. The preparation must be kept in a bottle closely cork'd, and out of the light. Dose from ten to twenty drops in a glass of water.

Nov. 5, 1822. Rec'd a valuable collection of fossils from Mr. Meade of Chatley Lodge near Bath.

Be still & know that I am God. Ps. 41, 10th.

The University of St. Andrews require a certificate on 4 points—1st; whether the person applying for a degree has a respectable character; 2nd, a liberal education, and 3rd, an attendance on a complete course of lectures on the several branches of medicine, 4th. if, from a personal knowledge you judge the applicant worthy of the honor of a degree of Medicine.

John Jenner, great grandfather of E. J. lived at Stannish.

June 6th, 1810. Rec'd a letter from Mons. le Doct. Corvissart informing me that he had presented my pet'n. to the Emperor, who had granted the liberation of Mr. Gold & Mr. Garland.

Jan. 7, 1810. Vaccinated Susan & Caroline who with their brother Stephen had been taken to the bedside of a patient full of the small pox. The two former were vaccinated, 1–2 years ago and the latter 12 years.

Jan. 22, 1810. Professor Rosenchoeld came here from Clifton; sent by him some vaccine matter for Mr. King, surgeon, Bristol. Repeated his former report, namely, that the small pox was totally extinct in Sweden. The means adopted for its extinction were these—an edict was issued for the universal adoption of vaccination. Medical men properly instructed took up the practice throughout the whole Swedish dominions. In those villages which had no medical men, the clergymen performed the office—and in districts where there was no clergyman, it was intrusted to the most proper person that could be found.

Jan. 29, 1810. Sent a packet to the York Hotel, Bath, for Professor Rosenchoeld containing a letter & six glasses with vaccine matter.

Sept. 1812. Dissected a cow's liver killed this day by Clarke. It was the soundest I had met with this season, one fourth only of it becoming schirrhous. The state of biliary tubes were precisely like that I have almost universally found them in. As the gall bladder was brought with the liver, I had an opportunity of comparing the increased size of these diseased ducts with the cystic duct (which was not at all diseased) and found them even near the extremity of the liver, five or six times it's diameter. The inflammatory process on the internal coat (wct. has the look of a mucous membrane) seem'd to be extinct; but it's consequences were manifest in the usual way.

Oct. 19, 1812. Wind S. W. A dreadful tempest during the night. It continued during the greater part of the morning with such heavy rains as to inundate the meadows surrounding the town. A rainbow in the evening—remarkably vivid. Flies crawling into the house in great abundance half drowned.

Nov. 27, 1812. Dissected the liver of a rotten sheep, universally of a pale brown & preternaturally hard. The biliary ducts enlarged most & most thickened as they advanced towards the extremities or edges of the lobes. In the chest of the sheep there was near a gallon of water, yet the lungs were sounder than they are commonly found when there is no disease, of this sort. By far the greater part of the liver was converted into a substance that could be of no use in the economy of that organ.

Dec. 8, 1812. Rec'd a letter from W. Hussey, M.D., D.I.H. dated Hope Lodge, Cape of Good Hope, Sept. 1, 1812. In this letter there is a detail of a most furious attack of small pox upon the settlement & of its complete extinction by the judicious application of vaccine innoculation.

Hothouse—From McDonald's Dictionary of practical gardening. 1 half strong brown loam, 1 quarter light sandy loan, 18 vegetables moulded & decayed leaves, 18 stable dung to wct. add about a fiftieth part shale marle. This is the composition Mr. Nichol says of the vine borders at Wemy's Castle none of which are less than four feet deep. The borders sho'd be made at least a month before the vines are planted, that the earth may have time to settle.

Admit that every ill report, however fabricated be true & what is it's weight in the balance against the immense mass of evidence from every quarter of the globe. Can persons out of the medical profession be safely trusted with vaccination? This query is answered by the numerous letters from Ladies and others giving an account of thier success, viz, from,

Mrs. Kingscote,
Lady C. Wothesley,
The Marchs. Cornwallis.
The Miss Necomes.
The Rev. Mr. Reed.
G. Jenner.
Mrs. (Col.) Beaumont.
Miss Bagley.

As God is ever present on this our composite dwelling place & even in this state we are allowed to dwell with him, may we not imagine that we shall dwell more immediately with him hereafter in disencumbered spirit on this our planet. Nay, are not the dead still living with us in a state of invisibility?

Children living in the same family where one is herpetic altho' no disease is perceptible on the skin frequently have incurred postules.

RED WATER IN CATTLE

Cows are most subject to it in the month of June, but they have the disease at all seasons of the year, tho' rarely in the winter. Calves are not exempt from it. They are seized with it as early as a fortnight old; nor are bulls & oxen. It is not confined to this species of cattle, as sheep are equally liable to it. I shall describe the disease as it appears in the cows. The first indication of the disease is the red tint of the urine wct. she voids much more frequently than in health. This is accompanied with an irregularity in the appearance of the feces, wct. are much more liquid than usual & not discharged without considerable effort, & in a contracted stream. Costiveness follows & the urine becomes of a darker red. The milk now lessens in quanity & is sometimes faintly tinged with red. On the third day, she commonly refuses food, & about the fourth or fifth day the pulse beats from 90 to 120 strokes a minute. The heart often palpitates with such force as to be heard at the distance of four yards. She becomes extremely weak & is incapable of rising from the ground. She has frequent shiverings, constantly moans, the extreme parts become cold & she expires commonly on the fifth day—while she has strength enough to walk, if she is hurried in her motions, she drops down and dies. Even under convalescence, if driven fast, she dies in the same way. I was induced to attempt to investigate this disease from the following considerations, the frequency of its occurrence in the summer, the general loss the farmer sustains by it's fatal tendency & the inefficiency of the remedy commonly employed for its cure. [For a note] as in the yellow jaundice turmeric, saffron, calandine & various other things, wct. were either yellow in themselves, or in decoction afforded a yellow liquor, so in the Red Water every drug was sought for that was red; at the head of these ranked Dragonsblood, Saunders wood, etc. I now only speak of the practice of the farmer or mere farrier. The Veterinary Surgeon has found himself puzzled.

Queries from the Norwich Union Life Insurance Company

1. How long have you known the Rev. Mr. Davies? From his earliest days.

2. Has he had a rupture? No.

3. How often have you known him professionally? Not often.

4. Has he had the gout? No.

5. Has he had a spitting of blood, asthma, consumption, or other pulmonary complaint? No.

6. Have any of his relations died of these diseases? Not that I known of.

7. Has he been afflicted with fits, or mental derangement? No.

8. And generally, is he subject to any organic or chronic disease? Nothing of the kind except hemorrhoids occasionally.

9. If the latter question is answered in the affirmative, wct. is the disease to wct. he is subject?——

10. Do you think his constitution perfectly good? Or on the contrary, that he has any hereditary taint or predisposition to any organic disease? I think his constitution a good one—I never yet knew a perfectly good constitution. I believe every const'n. predisposed to organic disease.

11. Are his habits in every respect strictly regular and temperate? His habits are remarkably regular & temperate.

12. Is he at present in perfect health? As near the point as in any man of his age I ever saw.

13. Is there anything in his form, habits of living, or business, which you are of the opinion may shorten the duration of his life? No.

14. What complaints are his family most subject to? I know not.

E. J.

Berkley, April, 1821.

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REMINISCENCES FROM THE EARLY DAYS OF THE PENNSYLVANIA HOSPITAL

By EDWARD A. STRECKER, M.D.

PHILADELPHIA

IN this day of jazz, cubism, futurism and individualism, historical monuments are not likely to be overwhelmed by attention. It is axiomatic that "the prophet is without honor in his own land" and it is a common observation that we travel thousands of miles to stand on the sacred soil of history while at the same time we may be blissfully unaware of the historical wealth which is at our very doors.

How many of us realize that our own Pennsylvania Hospital is the cradle of American psychiatry? The principal motive which had inspired the founders of the Pennsylvania Hospital as well as the main argument expressed in the petition to the Provincial Assembly afterwards embodied in the Act of May 11, 1751 was "the cure and treatment of lunaticks," in order that "they may be restored to reason and become useful members of the community." It was principally out of consideration for those unfortunate beings who through loss of reason had become "a terror to their neighbors," and for whom no adequate provision had hitherto been made, that the Managers felt the necessity of providing temporarily the building known as Judge Kinsey's Mansion, for hospital purposes. Of the 2 patients who were admitted on the first day after the doors were opened February 11, 1752, one was a "lunatick" recommended by the Visitors of the Poor of the City.

It soon became obvious that the apartments provided for the insane were in the language of that day "not convenient" and in 1755 building operations were begun, which when completed in 1756 provided better accomodations. That the needs of the mentally sick were constantly in the minds of the Managers was evidenced by constant improvements in housing conditions, which in 1835 culminated in the following:

> Resolved that in the opinion of this meeting it is expedient that the lunatic department of the Pennsylvania Hospital should be removed from the City of Philadelphia to the country in its vicinity, provided that the removal can be effected upon such a plan as will promote the comfort and improve the health of the patients and admit of the superintendence and control essential to a good administration of the institution.

The cornerstone of the building which now stands at 44th and Market Streets was laid on July 22, 1836 and for many years this building was the model for mental hospitals all over the world. It may not be beside the mark to mention that on September 17 1928 ground was broken at 49th and Market Streets for the erection of a modern and scientific Psychiatric Institute.

It is interesting to note that at as early a date as 1756, almost forty years before Pinel began to preach his doctrine of humanitarianism, the Pennsylvania Hospital had provided for the insane not only extensive grounds but also "a gallery eighty feet in length for such of them as may be trusted to walk about, with a place for bathing."

The therapeutics of those early days was complicated and decidedly unpleasant for the unfortunate patient:

> The medical treatment appears to have been directed principally to the acute or sthenic forms of lunacy, or cases of so-called phrenzy. These were douched or played upon with warm and cold water; their scalps were shaved and blistered; they were bled to the point of syncope; purged until the alimentary canal failed to yield anything but mucous, and in the intervals they were chained by the waist or the ankle to the cell wall. Under this heroic regimen, some, probably the most sthenic, recovered their reason. There appears nothing in the records to indicate any special mode of treatment for melancholia, or for the stuporous forms of mental disorder. Later there were mentioned certain special appliances for rousing such patients, which judging from the description must have, temporarily at least, effected the desired object.

Restraint was freely utilized. For instance, an account of March 7, 1752 reads as follows:

> John Cresson, blacksmith, against ye hospital, 1 pair handcuffs, 2 legg locks, 2 large rings and 2 large staples, 5 links and 2 large rings and 2 swiffells for legg chains. To 3 locks, 13 keys, chains and staples for cells £1.10.3—5 Mo. 25th, 1752. On 5th Mo. 1754 Paid for 7 yds of Ticken for Mad Shirts, £0.16.4½.

To those of us who lose our tempers if a Wassermann report or a blood count is delayed several hours, it may be salutary to recall that in the days of which I am speaking, the Managers and Physicians were concerned with more or less (and principally less) successful attempts to protect the patients from rats and to furnish them with heat and light. The cells for the insane were without adequate heat for almost eighty years, until 1833. In this connection the historian of that day observes: "The insane were not supposed to require, nor to quite deserve, the usual comforts of life at this period, when even the sane dwelt in cold houses, slept in cold apartments, and sat through the long winter evenings by candle or fire light."

The formalities of admission were exceedingly simple. There was little required beyond the application of a friend or, as has been noted in the history of the hospital, an enemy of the patient, to one of the Managers or Physicians. The informality of the day may be expressed by quoting a few of the records of admission:

> Dr. Moore's Negro man, a Lunatick was received 3rd Mo. 26th, 1753. His master promised payment. 1st Mo. 23rd. 1754. Admitted Negro Adam, a Lunatick and pay patient belonging to Mrs. Margaret Clymer, under the care of Dr. Thos. Bond. 2nd. Mo. 16th, 1754. Black Adam, at ye request of his Mistress Margaret Clymer, was this day discharged. 6th Mo. 26th, 1754. Admitted Negro George, a Lunatick belonging to Mr. Carrington of Barbadoes, a pay patient at 10 s a week, under ye particular care of Doctor Shippen who engages for his board.

It may be interesting to quote from the earlier records and minutes:

> May 10th, 1762. The great crowds that invaded the Hospital give trouble and create so much disturbance, that Samuel Rhodes and Jacob Lewis are directed to employ a workman to make a suitable hatch door and get an inscription thereon notifying that such persons who come out

of curiosity to visit the house should pay a sum of money, a Groat at least, for admittance.

Later, this rule seems to have fallen into disuse, as, on April 27, 1767:

> Orders were renewed that the Hatch door be kept carefully shut and that no Person be admitted into the House without paying the gratuity of Four Pence formerly agreed upon, and that care be taken to prevent the Throng of people who are led by Curiosity to frequent the House on the first day of the week, to the great disturbance of the Patients.

From time to time other measures had to be taken to preserve order. On August 30, 1784:

> Dr. Foulke recommended that some regulations may be made in respect to persons visiting the Hospital, particularly in adopting such Rules as would tend to preserve the Lunatic Patients from being interrupted and disturbed in their course of Medicine. Ordered that the Sitting Managers consult with as many of the Physicians as they conveniently can and report such rules and regulations at our next Stated Meeting as will be most conducive to remedy any present Evil on that head which may now exist.

Whereupon, on October 4, 1784:

> They Reported that they had found it useful in adopting the following regulations respecting the Lunatic Patients: viz: The putting up an Advertisement or Rule forbidding more than two Persons at one time to be permitted to go into the Cells and those Persons to be attended by the Cell-Keeper and not suffered to speak to such Patients.

In 1791, as complaints had been made by the Physicians that company was too freely admitted, to the great injury of lunatics, it was resolved:

> That no Person whatever should be hereafter allowed to enter the Grounds, or Cells inclosed for their Accommodation, unless introduced or allowed by one of the Managers, Physicians or by the Steward, to which resolution the Cell-Keeper was strictly to Attend, and to keep the Gates and Wards locked in future, to prevent all Intruders who might attempt to enter therein, without such permission being first obtained . . .

May 28th, 1758 Admitted, Martin Higgins a Mad person, who having, as many others do without leave, gone through the House to the Top, & there Carelessly and Imprudently running about, fell thence to the ground & was so much Hurt that his recovery was doubtful.

July 28, 1758. Escaped Jacob Ashton by boring thro' the Door of his Cell & forcing out the Steeples of ye Iron Bolts.

August 28th, 1758. Admitted A. D. an Outrageous Person.

January 27th, 1759. Discharged—the lunatick Jane Hughes at the Request of her husband who paid £3 to the Matron in full for her Accommodation. The Damage done to the Cells & c. is Forgiven in Consideration of her Poverty.

January 27th, 1759. Escaped Jno. Jones, a Lunatick; he forced Barrs of his Cell in ye night and fled without Notice.

November 26th, 1759. Admitted Hariott Hamilton a Lunatick, reputed Daughter of the late Duke of Hamilton, to bee in ye Hospital till a Vessel sails.

December 31st, 1759. Admitted Solomon C., a Drunken Mad Man, at the Request of his Brother & by Desire of T. Stampe, ye Mayor, the former agreed with ye Board of Managers for his Maintainance.

In the same year 1759: "Admitted Mark Kuhl junr., an Irregular Person on pay @ Ten Shillings P. Week." Evidently Mark was quite irregular since there is a further notation that "He left the cells irregularly i.e. broke the window and ran away."

William, son of Joseph Hart, a Lunatick and pay Patient. He is also to pay for a Negro man he has to tend him.

Alexander McCurdy—Pay patient, bro't down by ye Overseers of ye Poor of the Townships of New Gulfhahoppen Alias Upper Hanover.

Thomas Dougan, a Lunatick, taken upon the Streets naked the 20th inst. Said to come from ye East Jerseys.

These quaint entries illustrate the kind of cases commonly received and the mode by which they were admitted, as does also the following ancient manuscript order:

City of Philadelphia, ss.:

Several Persons of good Reputation having appeared before me ye Subscriber, one of ye Justices of ye Peace for ye City of Philada. & complayned that Thomas Ackley, Chairmaker, hath frequently behaved in a very disorderly manner to ye great Terror of his Family & Annoyance of his neighbours, Wherefore, Apprehend ye sd. Thomas & take him to ye Workhouse of this City, the Keeper whereof is hereby required to receive & Employ him in ye Common Labour of the House, till further orders.

But if ye sd. Thomas or his Wife shall when he is arrested, request that his Confinement may be at ye Pennsylvania Hospital, in that case deliver him to ye Steward of ye sd. Hospital, or to ye Keeper of Lunaticks there, who shall then receive and safely keep him till he is discharged by proper Authority.

Given under My Hand & Seal December ye 22d, 1763.

To any Constable.....Smauel Rhoads.

Mary, the wife of Stephen Girard, was admitted on December 31st, 1790 as a pay patient at a rate of 25 s. per week. The records state:

On the 3rd, Instant, Mary the wife of Stephen Girard was delivered by Dr. Hutchinson and William Gardner of a child, named, in the presence of Edward Cutbush and others, Mary, which on the 7th instant was put out to nurse with John Hatcher's wife, at 10 s. Per Week.

This infant, which was the only child of Philadelphia's great benefactor, died August 26, 1791, aged five months and twenty-three days. Mrs. Girard remained a patient until her death, which occurred September 13, 1815, after she had dwelt continuously in the Hospital for twenty-five years. At the request of Stephen Girard she was buried in the Hospital enclosure. Girard gave the Hospital $2000 on October 30, 1815, and bequeathed the institution $30,000 by his will.

I cannot resist retailing a single incident from the life of Polly, a beautiful girl, whose insanity was attributed to dissappointment in love. The story has the authority of Mr. Samuel Coates who was one of the Managers of the Hospital during Polly's residence. I give you the tale in the words of Mr. Coates:

I was walking on the Commons, and heard a great noise. Where it came from I could not tell, but list'ning Attentively, I discovered it was from the blue house, and directing my course there, I found it to be the Shouting of a great number of people. They were Assembled to a Bull baiting, which in those days, was a common practice.

The Animal appeared to be in a great rage, tho' much exhausted by the Dogs, before I reached the Scene of Action. Soon after I got there, a Small Mastiff was sett on, which he threw about ten feet high, & he fell to the Ground with his upper jaw broke & Every tooth Out.

A short rest was now again given to the Bull, when a presumptious little Man, to shew what he could do, run towards the Animal, but Returned faster than he went, for the creature took him under his breech & tossed him about 12 feet from the end of the Rope.

A new pack of dogs being procured to renew the fight, every Eye was turned to the Onset.

> At this moment, Polly scaled the high fence, thro' the Cracks of which she saw the battle & pitying the Bull, She pierced unseen thro' the Circle & ran up directly to the Ring; and without Shoes or Stockings on: with her Bosom all open; her neck bare and her beautiful Ringlets wildly dangling over her Shoulders—her other Cloathing was her Shift only and a white pettycoat; so that she appeared more like a Ghost than a human Creature. When She reached the Bull, (tho' previously & almost immediately before, he was in a Rage) She Accosted him thus—"Poor Bully; have they hurt you? they shall not hurt you any more," & stroking his forehead & his face She repeated "They shall not, They shall not hurt thee." This was indeed Wonderful; but the Animal's behavior was not less so, for he no Sooner saw her approaching him, then he dropt his head & became Mild & Gentle, As tho' he knew She was sent to deliver him.
>
> The whole concourse of Spectators saw it, and were Struck with Astonishment—not one of whom dared to enter into the Ring to save her; but stood trembling for Polly's life, afraid to stir a Step and even to follow her on the Return, when she darted thro' the Ring, Thro' the Midst of the dumb Struck Company, like an Arrow from the Bow, Over the high fence again to the Hospital from which she eloped.

The Pennsylvania Hospital extended its gracious and helping arms to the sick in mind before the days of humanitarianism. It must be remembered that it was the age of man's inhumanity to man. The insane were huddled together, irrespective of sex and were kept in order by "keepers," who were hired to keep the patients and their cells clean, to perform all the menial drudgery which that involved, to watch the lunatics when they exercised in the yard and keep those who worked about the garden and lots from running away. One of their chief duties was to preserve discipline and order among the unruly. This was done with a strong hand and in a punitive spirit. The insane were chained to rings of iron, let into the floor or wall of the cell, or were restrained in hand-cuffs or ankle-irons; and the straight-waistcoat, or "Madd-Shirt," was in frequent requisition. This was a close-fitting cylindrical garment of ticking, canvas, or other strong material, without sleeves, which drawn over the head reached below the knees, and left the patient an impotent bundle of wrath, deprived of effective motion. In the earlier years it was not considered improper or unusual for the keeper to carry a whip and to use it freely. These methods begat violence and disorder in the insane who were then, for that reason, a much more violent and dangerous class than they now are, and the keeper's life was neither an idle nor a happy one. From the number of his duties about the house and grounds, unconnected with the care of the insane, it is evident that the patients must have passed the greater part of their time locked up in the cells.

In 1782 a patient, in a letter addressed to the Managers, says: "I am Confined here in Chains at the instance of a Relative of my Wife's—I hope you will Desire the Steward to unchain me; but, as his Duty, he could do no less." Later he writes: "The present serves to Inform you that pursuant to your Orders, I am Unchained." The spirit of humanity was doubtless as strong in those early days as it is with us; but the ideas as to what constituted humane care were very different; they were in process of gradual evolution from primitive modes of life and crude social customs to the advanced ideas of non-restraint and kind treatment which now prevail.

From the very beginning the Managers sought to lighten the burden of the suffering patients. Always the Hospital was in advance of its time. Better physical conditions, separation of sexes, exercise, light, air and sunshine were provided. Dr. Benjamin Rush had constantly in mind the needs of the mentally sick and at his initiative many improvements were put into operation. It would be pleasant to reflect that the shades of those Managers and Physicians who in the early days of the Hospital labored so effectively against almost overwhelming odds might now be able to realize that their labors were not in vain. Down through the years in unbroken line, other Managers, often the descendants of those who gave the Hospital its birth have continued to devote their lives to the care of the mentally afflicted; have kept pace with the development of scientific psychiatry but have never departed from that great law of God and man, "Do unto others as you would have them do unto you." It would be good to be able to believe that the first Managers of the Hospital could know that those who came after them have kept the faith.

LARREY, NAPOLEON'S CHIEF SURGEON

By E. ROBERT WIESE, M.D.

INGOMAR, PA.

DESPITE the fact that about Napoleon there has grown a literature greater than that about any other man except one, very little has been written concerning the men without whose aid he would not have risen to renown. Not even his marshals, Ney, Murat, Kléber, Junot, Grouchy, Bernadotte, shine except by reflected glory. And of the chief surgeon of that great army, of the man who went with Napoleon from Italy to Waterloo, even most physicians know not the name.

In writing the lives of the truly great the temptation to indulge in superlatives is almost irresistible. Such usage often provokes comparison and not infrequently disagreement, if not resentment. But that Dominique Joan Larrey stands alone as the greatest military surgeon in history is generally admitted. None but Ambroise Paré can stand beside him. Both had unusual individuality, self-reliance and ability; neither respected theories made sacred by custom and honorable by age alone. Both tried all things and held fast to that which they found good. To say that Paré was the greater surgeon while Larrey was the greater administrator is to create differences where none exist. If, however, greatness in military surgery consists in determining among all the methods in use the best method, in opening new fields whereby a larger percentage of those wounded or sick are saved, then verily Paré hath saved his thousands, but Larrey his tens of thousands.

DOMINIQUE JEAN, FIRST BARON LARREY [1766–1842]
"C'est l'homme le plus vertueux que j'ai connu."
—NAPOLEON.

Dominique Jean Larrey was born on July 8, 1766 in Beaudeau, a small village near Bigore, noted since the time of the Romans for its medicinal waters. High in the Pyrenees, remote from the devastating and enervating influence of the larger cities, there was still preserved in these hamlets and villages that strength and stamina and force of character that later saved the nation. This was the most degraded, degenerate, corrupt and miserable period of all modern French history. The king, a veritable satyr, mindful only of his lustful and selfish pleasures, under the spell of a recent shameless and scandalous Pompadour and in the toils of a present Du Barry, directed a court little removed from a seraglio where intrigue and hypocrisy, immorality and debauchery reigned supreme. Paris was a cesspool of poverty and squalor, ignorance and iniquity. Stripped of her American and Indian possessions by the Seven Years' War, her commerce lost and her credit ruined by incapable and irresponsible administration, oppressed by excessive taxation and incredible debt, exploited by those in the seats of the mighty, France, after a century of neglect and misrule without rulers or leaders, was fast tottering to that abyss and horror that engulfed her in 1792.

Because of the straitened circumstances of his parents (sturdy, honest, upright peasants) it is doubtful whether Jean would have received any schooling had not his voice, as he sang in the choir, attracted the notice of the Abbé de Grasset who took the boy into his care and educated him. Following the death of his father in 1779, the boy, then only thirteen years of age, was sent to live with his uncle, Alexis Larrey, chief surgeon to a large hospital and quite a successful practitioner in Toulouse. Under his guidance Jean first finished the course in the college and then attended the Toulouse School of Medicine and Surgery. He thus spent eight years, during which time he also attended the hospital. At the age of fifteen he was appointed sous-aide (dresser) and later became aide-major (house surgeon). In 1787, after having studied under Louis in Paris, he passed an examination, was appointed auxiliary surgeon in the navy and was ordered to proceed to Brest. The fact that he walked from Paris to Brest acquaints us not only with his financial condition, but also with the fact that, even at that time, he had the foundation of that strength and wonderful constitution that permitted him to refer to himself in after years as the strongest man in Napoleon's army. Arriving at the great naval station he took a second examination and was appointed chief surgeon to the cruiser The *Vigilante* detailed for duty about the cod fisheries of Newfoundland. The few months preceding the sailing of that vessel were spent in teaching and lecturing on surgery and anatomy. He was also interested in the Brest prison for galley slaves, where Vidocq, afterward Napoleon's chief of police, spent some time as a prisoner.

The *Vigilante* sailed from Brest in April, 1788 to be gone six months. Seasickness early convinced Larrey that any talents he might possess would be more easily developed elsewhere than in the navy, and upon his return in October of the same year he arranged to retire from active service. The voyage, however, was not without many interesting happenings, none of which escaped his restless curiosity. In his notes he discusses seasickness (and in view of his sufferings no man was more competent), frost bites, the Eskimos (their habits, dress, food, etc.), plumage of birds in the Arctic zone, mosquito bites, catching and cleaning of fish; and like him we also wonder as to the fruits of the ill-mated love affair between a cow and a caribou that forced its way into the fold.

Early in the following year (1789) he went to Paris, a seething mass of discontent. Voluble as he is everywhere else and at all other times regarding anything of interest, Larrey is here peculiarly reticent, so much so as to arouse suspicion that part of his notes may have been either lost or purposely omitted from his journal. That he served under Desault is known from the fact that he helped tend the victims of the assault on the

Bastile. In April, 1792, he joined the Army of the Rhine at Strassburg as surgeon of the first class. In the battles about Mayence and Frankfort, impressed with the pitiful state of those wounded in action, possibly the more so because he himself was shot in the leg, he conceived the idea of the ambulantes volantes as a method of relieving the poor unfortunates. While at Mayence, Larrey attended the lectures of Sömmerring and did some experimental work in galvanism. The needle that since bears his name was devised at the same time.

Partly, if not wholly, because of his insatiable curiosity Larrey always cultivated friends wherever he went; and among those of whom he was most fond while at Mayence was General de Beauharnais, whose opportune death by the guillotine enabled his widow to become the Empress Josephine. The army having gone into winter quarters, Larrey was sent to Paris to complete the organization of the ambulance service and to establish it in the different armies of the new republic.

During his stay in Paris he found time to marry Charlotte Laroux de Laville, the daughter of one of Louis XVI's ministers of finance. The honeymoon was spent largely in a stagecoach as Larrey had been ordered to join the Army of the South at Toulon. Here he met an undersized, pale, long-haired, reserved and almost emaciated, twenty-five-year-old artillery officer named Napoleon Bonaparte, who had played no small part in the capture of the town from the English the year before. The army had for its object the invasion of Corsica, but then as so often afterward the French proposed but the English navy disposed of the scheme, and Larrey went with the troops to Nice where he spent some time with the Army of the Maritime Alps. While there he formulated some ideas regarding resuscitation of the drowned. He was next sent into eastern Spain as chief surgeon of the Army of the Pyrenees. His journal tells us of much besides surgery that interested him during his stay in the Peninsula; the good taste, the customs, the habits and the love of beauty of the natives are all noted. It was also during this time that his interest in burns was aroused. At the conclusion of peace Larrey returned to the French capital a very sick man. He was permitted to enjoy the gayeties of Paris less than a year, however, but during that time he opened a school of anatomy, physiology and surgery for army and navy officers. He was also appointed professor of surgery and anatomy at Val de Grace. In May, 1797, Larrey, now chief surgeon of the Army of Italy, was ordered to Montebello where Napoleon gave him carte blanche in the organization of the medical division. While among the Alps he was much impressed by the cases of goiter and cretinism he saw, and attributed the condition to the drinking of snow water. Once established in Northern Italy he traveled from place to place, establishing with tireless energy schools of military surgery. It is probably due to this constant work on Larrey's part that the French army surgeons were the best in the world at that time. But his interests were ever far wider than his vocation. In his journal he comments upon the gayety, the indolence, the voluptuousness, the luxury of the Venetians and marveled, as so many before and since him have done, at the magnificence of the Cathedral as well as at the beauty of the art and the sculpture. During the course of his travels he visited both Scarpa and Spallanzani at Pavia. Seven months after having joined Napoleon (December, 1797) Larrey returned to Paris and not only took up his duties at Val de Grace, but began to prepare medical officers for the expedition into Egypt which left France on May 18, 1798. Were it fully treated the medical history of that expedition alone would require a volume. Plague, leprosy, elephantiasis, scurvy, tetanus, ophthalmia and especially nostalgia (particularly among the officers) tried the skill and the patience of the medical corps. The plague was very virulent: in one hospital, for example, every nurse that was on duty when the place was opened as well as fourteen surgeons, eleven apothecaries and three physicians died in less than eight weeks' time. At Jaffa Larrey performed several post-mortem examinations of the bodies of plague victims but in spite of direct contact on every hand, he was not attacked. Food was scarce at times and it was during this campaign that Larrey learned that excellent broth could be made from the officers' horses. But even with all the press of army work and the impeding effects of a wound, Larrey yet found time to write of things other than medicine and surgery; and slaves, Egyptian midwives, camels, baths, Arabian horses, caravans, seraglios, the dances, the habits, the customs of the people, and even embalming are treated of at length in his journal.

On account of political crises in Paris and the questionable conduct of his wife Napoleon determined to return to France, leaving the army in charge of Kléber who was assassinated by a religious fanatic. The "Little Corporal" wished Larrey to go with him but he refused to desert the sick, the wounded and the dying and did not reach Paris until December 24, 1801, with the army that had been returned to its native shores in accordance with the terms of surrender. Larrey was received alike by the French Academy and by Napoleon, who was then the French government, with open arms. He became Chief Surgeon of the Consular Guards, was appointed "Inspecteur General du Service de Santé," received the insigna of the Legion of Honor and was made chief surgeon at the Hôtel des Invalides. Very soon after his arrival, however, Larrey was again at his usual teaching and lecturing. That he lectured on experimental surgery is worthy of note. Peace with England was broken in 1803 and an immense army was assembled about Boulogne and Brest, ostensibly with the intention of invading the British Isles. The English navy again effectively frustrated any such designs on Napoleon's part and by one of those lightening moves so characteristic of the man, the army was in Germany on the way to crush Austria, the chief instigator of the European Coalition, before any of his enemies realized that the army had broken camp. Larrey, as chief surgeon, was with them and on the way spent a few days with Sömmerring in Munich. This campaign culminating at Ulm and Austerlitz was one of unusual severity, with almost constant exposure to snow and cold rain, as well as long, hard, forced marches but the soldiers were well fed and among them there was surprisingly little sickness. The experience confirmed Larrey's confidence in Frederick the Great's dictum that "an army like a serpent travels on its belly." The wounded of Austerlitz (the battle of the nations and the bloodiest of all Napoleon's conflicts), were removed to Brünn, a name ever memorable in military medicine. For here a peculiar epidemic, diagnosed by different authorities as typhoid (Da Costa), exanthematous fever (Edgar), and typhus (Gubbins), made its appearance. Of those afflicted one fourth died. On his return to Paris in 1806 Larrey immediately took up teaching. This was only for a few months as the army was soon on the way to Germany. Larrey was in Berlin with Napoleon (October, 1808) where he stayed for several months and met such men as Loder, Alexander Humboldt, Goerke, both the elder and the younger Walther, and Goethe. In accordance with his habit Larrey gave a course of lectures and demonstrations in anatomy and surgery. Early the next year he went with his chief into Poland and was present at the frightful battle of Eylau (February 8, 1807).

Because of the intense cold few of the surgeons besides Larrey could operate. The losses and suffering on both sides beggar description. It was here that the starving wolves came out from the forest and added to the horrors and agonies of the dying and the wounded. Napoleon visited the hospital quite frequently during the ten-day halt at Eylau and was so impressed with what he saw that he advanced Larrey to the rank of Commander of the Legion of Honor and presented him with a sword. The battle of Friedland, fought the next June, forced the treaty of Tilsit, after which the army returned to Paris. In recognition of his services during the campaign Larrey received from the emperor the title of Knight of the Iron Cross, and upon the ribbon was the single expressive word "Eylau."

Peace was of only short duration. Soon afterward the disastrous Peninsular War began and for the second time Larrey went into Spain. Here, as elsewhere, he established military medical schools and took part in many of the hotly contested battles. The Spanish, however, might lose battles but they were never beaten. Fired with a religious fanaticism, they carried on a guerilla warfare that would have thrilled the heart of a man like Daniel Boone or any other of our frontiersmen but which completely demoralized the trained French troops. Sickness was prevalent among them and an epidemic breaking out among the English prisoners quickly spread to the French army. The desperation with which war was waged is evidenced by the fact that among the sick was a puny little English drummer boy of less than thirteen years of age. Immediate steps were taken by Larrey to isolate all the cases and to establish a rigid quarantine. His own health gave way; for a time he was so ill that his life was despaired of and bulletins announcing his death were actually circulated in Paris. For seven weeks he lay at Burgos attended by his cousin, Augustin Larrey. He reached Paris on April 5, 1809 but complete convalescence was denied him for the Austrian campaign had begun and while Larrey was not present at the battle of Ratisbon, where Napoleon was wounded in the right ankle, he did join the Emperor at Augsburg. The battle of Essling (May 22, 1809) found Larrey in the thick of the fight, the wounded being taken care of on the Isle of Lobau in the middle of the River Danube. The food supply became very low and Larrey commandeered and killed the officers' horses, used the cuirassiers' helmets for kettles and gunpowder in lieu of salt to make broth for those under his care. Lannes was killed at Essling and Larrey made practical use of the knowledge of embalming he had acquired in Egypt in preserving the body of one of Napoleon's greatest generals. At the decisive battle of Wagram (July 6, 1809) Larrey was cited for bravery and gallant service, in recognition of which he was made a Baron of the Empire and was granted a pension of five thousand francs. He did not return to Paris immediately following the signing of the armistice (July 12, 1809) but elected to remain with those who so sorely needed him and did not reach Paris until the next November. In his report of the campaign he emphasizes the relatively high proportion of those wounded by artillery fire at Essling and Wagram and contrasts it with the astonishing low mortality of 11 per cent.

From November, 1809 to February, 1812 he was in Paris, lecturing, teaching and attending the sick and wounded at the Hôtel des Invalides and at Val de Grace. But in February of 1812 he was ordered to join the Grand Army preparing to invade Russia. He made Berlin his headquarters and at once opened a school of surgery and anatomy not only for the French but also for those Prussian officers that might be in their capital city. This school was later instrumental in saving his life.

The army began to move on June 24, 1812 and arrived in Smolensk on August 18, 1812 with the medical corps in good condition with only a few wounded but with a large number sick. The oppressive heat of the northern summer was intolerable to the newly levied troops, who sank from exhaustion by the hundreds. It had been understood that they were to halt in Smolensk for the winter, establish lines of communication with the larger cities of Germany, Austria and France, which would serve as bases, and then proceed into the Russian interior the next spring. The sudden decision of Napoleon to advance on Moscow at once upset all the plans so carefully formulated and the army left Smolensk with only a minimal medical and surgical equipment. The lack of means, as well as the difficulties of transportation, forced Larrey to leave the wounded in the small villages along the line of march, instead of removing them to the base hospitals as had been his custom, in the hope and expectation of having them picked up the following spring by the reserves on their way to join the main army. Once in Moscow, he at once began to establish hospitals and to look out for the welfare of those that required his care. He seems to have become well acquainted with the city in the short time between the occupation of the place and the breaking out of the fire and apparently knew there were provisions, even in the ruined city, sufficient to feed the army for six months. He opposed the idea of retreat and did his best to dissuade the Emperor from the contemplated return to France at that time, but without avail. The retreat was ordered and Larrey, instead of being able to pick up the many wounded he had left in the villages during the advance, was forced to add to their numbers and abandon them to the mercies of the cruel, relentless and barbarous Cossacks, as pitiless as the elements. The suffering, the agony, the tortures of that grewsome and appalling march are now a part of history. The effect upon the medical corps is evidenced by the fact that while at the beginning of the campaign the officers of the "Service de Santé" amounted to eight hundred and twenty-six men, only two hundred and seventy-five remained on February 15, 1813. Death from battles, diseases, cold, or what was worst of all, capture, made a loss of over 66 per cent of the original number.

Larrey walked practically every step from Moscow to the Vistula, helping those he could, in many instances giving to the wounded the small portion of food that fell to his lot, encouraging by deed more than by precept and urging the men not to get too close to the fire, in order to avoid frost gangrene. On this *via dolorosa* he used whatever came to his hand for supplies; paper and shredded birch bark served for dressings at Smolensk. Napoleon, however, did not wait for the pitiful remnant of his former magnificent army to emerge from Russia but hurried on to Paris, where affairs were in a turmoil. Reorganizing an army of three million men he hurried forth to meet the Allies. Lützen, Bautzen, Hanau and chiefly Leipzig represent the last efforts of a desperate genius to retrieve his lost fortunes. Overwhelmed by numbers and yielding to necessity, Napoleon abdicated the throne and went to Elba. Larrey had remained with the troops in their retreat and did not reach Paris until January, 1814. He was present when the Emperor, deserted alike by Fate and by most of those whom he had elevated to the seats of the mighty, signed his abdication on April 17, 1814. Of the many whom Napoleon had exalted to high places, only a few stood by him in the bitter hour of renunciation of all the power and glory that had been his as emperor of a mighty nation, and of that small number Larrey was one of the fewer that offered to accompany him into exile. Napoleon, deeply moved by this evidence of loyalty, begged his former chief surgeon to remain with the army, where he could do the most good. During Napoleon's period of enforced rest at Elba, Larrey was a member of the medical board, but made no attempt to conceal his lack of affection for Louis XVIII.

On his return to Paris (June 7, 1815), Napoleon found Larrey ready to serve him and not even the Emperor worked harder or more intensely than did Larrey during the Hundred Days. He joined the army on June 7, 1815 and with his beloved chief crossed the frontier into Belgium eight days later. He witnessed the defeat of the Prussians at Ligny. At Waterloo he established his hospitals at Caillou and at Belle-Alliance. On the fateful day of Waterloo he worked from eight o'clock in the morning until the order of "*sauve qui peut*" was issued at eight in the evening. Napoleon ordered Larrey to save himself. Larrey and several of his aides mounted horses and were well toward the border when they were overtaken by Prussian cavalrymen. Larrey discharged his pistols without effect, his wounded horse threw him to the ground, two saber cuts left him unconscious and the Prussians, believing him dead, left him to his fate. Upon regaining his senses he started on foot for France but was captured by a second detachment of Prussians who dragged him before a senior officer. A short, stout, stocky figure with a long, gray great-coat with the typical three-cornered hat (which Larrey affected) and a beautiful sword upon which was engraved "Napoleon," quite naturally led the Prussians to believe that they had before them the Emperor of all the French. Blücher at the opening of the campaign had ordered Napoleon to be shot immediately following capture without benefit of court-martial, but the surgeon major who came forward to bind the condemned man's eyes recognized Larrey as the former lecturer in Berlin in 1812 and protested against the execution. Finally brought before Blücher after much red tape, he was recognized by the old Prussian as the man who had saved his son when the wounded young man had been captured by the French in the Austrian campaign. The old marshal ordered Larrey released, apologized for the treatment he had received, sent him to Louvain (where he took care of the French wounded) and even went so far as to have Larrey's wife notified of her husband's safety.

Contrary to Napoleon's statement regarding the Bourbon intellect, the King had at least learned and not forgotten who had served his enemy and Larrey was among those listed to be shot. He escaped, however but with the loss of all his honors, position and wealth. Reduced to poverty, Larrey began private practice and like his captain at that time very seriously contemplated coming to America and practising surgery. Alexander, recognizing the genius of the man, urged him to come to Russia and organize the medical department of his army, while Don Pedro did his utmost to induce him to emigrate to Brazil. To add to Larrey's grief and distress at this time he lost both his mother and a favorite brother. It seemed however that he could not remain inactive and it was during this time of storm and stress that he completed those famous memoirs that will ever remain an ornament to the history of medicine and surgery.

In 1818 it seemed that Fortune was once more beginning to smile upon him as his pension was restored and he again became surgeon of the Royal Guard. The grief caused by the death of Napoleon in 1821, in his lonely island prison, was intensified by the fact that Napoleon had thought of him in his last hours. Honors again came to Larrey as he was restored to his old position in the army shortly afterward and when in 1826 he visited England, the island's greatest men vied with each other to do him homage. Horne, Carmichel, Cooper, Lawrence, Guthrie, Admiral Malcolm, Sir Sidney Smith and Sir Walter Scott, to mention only a few, received him with the deepest respect. Upon his return to Paris he continued to teach and was again made surgeon-in-chief of the army and chief surgeon of the Invalides. In July, 1830 he took care of those wounded in the uprising that overthrew the government of Charles x. One year later, on the invitation of the King of Belgium he visited that country and suggested changes and improvements in the army hospitals. In 1834 he toured southern France and Italy. To his joy and great surprise he found his old teacher, the Abbé de Grasset, to whom he owed so much, alive and in good health still in his old parish.

What a contrast these two must have presented! Shielded by the isolation of his position from all the realities and hardships of life, the elder man, lowly and infirm, sustained by that faith that passeth all understanding, was calm, cheerful and philosophical; the other really started on his glorious career by the first, now strong, hardy, successful, honored, stood forth forceful, impatient and wise in the knowledge of all the world could teach of pain, sorrow, suffering and disappointment. While in Rome Larrey visited Napoleon's aged mother and was much affected by the warmth with which she greeted him. To her and to Larrey alike Napoleon was always a benefactor of mankind, a great soul and a genius; and on December 14, 1840, when a negligent government, amid pomp and splendor, finally brought to its last resting place all that was mortal of the man who had done so much to elevate the nation, one of the most impressive figures in that magnificent procession was that of an old man of seventy-four, in the uniform of the Imperial Guard that had been worn at Wagram, who, despite the extreme cold, followed the body of his beloved chief and comrade, bareheaded, with tears in his eyes, to that awe-inspiring sarcophagus in the Invalides.

Two years later trouble broke out among the conscripts in Algiers because of the severity of punishments meted out for slight offenses. Larrey was sent to investigate, reported conditions as intolerable and denounced the punishments as inhuman and barbarous. On the homeward voyage Larrey for the first time in his life admitted fatigue. Landing at Toulon he was notified of the illness of his wife; traveling by day and night as fast as possible to reach Paris he developed pneumonia and was compelled to stop at Lyon where he died July 25, 1842. Unknown to him his wife had died two days before. Thus these two, united in life for nearly half a century, were not separated even in death. Funeral services were held in both Lyon and Paris. He was buried in the cemetery of Père-Lachaise where repose such heroes as Marshals Suchet, Davout, Kellermann, Messena, Ney, Grouchy, Macdonald and Generals Junot and Foy.

THE MAN AND HIS WORK

To most of this material age and generation Larrey would be great, merely because of the large number of operations he performed and the number of sick and wounded he attended. That he had extraordinary experience none can or will deny. To not a few to whom gross production and financial return serve as a standard, fame is in direct proportion to one's yearly income or the number of operations one has performed. If this be the true standard it would seem that Clio as well as Themis were blind. There are today serologists doing more Wassermann tests within a week than the originator of that test did in a month, but their names are not recorded; there are surgeons today who do more gastroenterostomies in a month than Billroth did in a year, but history knows them not; there are today physicians whose monthly income probably exceeds what Osler made in a year, but we vainly seek the records of history for their names. Not "how many," not "how much" but rather "when, where, why, how well," seems to be the concern of the recording angel.

In military surgery, as in other branches of medicine, there are not a few names that are preeminent. Paré, Bulguer, Warren will ever be renowned. Larrey, however, is not only among the world's great military surgeons; in the history of military medicine Larrey stands forth as *the greatest* military surgeon. May he never have a rival!

Had he done nothing more than devise the ambulantes volantes his would have been one of the illustrious names in military surgery. Comparison of these with the ambulances used by the French army, even during the time of Louis xvi, will best show how great an improvement they were. The old cumbersome vehicles, each carrying an immense equipment and a personnel of one hundred and thirty-four persons (of which thirty-one were surgeons and thirty-one were presumably trained nurses), were so colossal as to require forty horses to move one of them. Because of their size, military regulations required that they remain three miles behind the firing line; a retreat necessitated abandonment of all the wounded unable to save themselves. Only after all fighting had ceased were the wounded collected in some convenient spot to have their wounds dressed, after which these ambulances finally gathered them in and took them to the hospitals. Retarded by the artillery and all the other delays of traffic usually found in such places, these immense vehicles never reached the wounded for at least twenty-four hours and rarely before thirty-six hours after the injury. Not a few of the unfortunate perished because of the lack of opportune first aid and proper care. That any survived seems but another evidence of the vitality possessed by some men.

Percy, another of the young Republic's surgeons, had devised something of an improvement on this Juggernaut of the battle-field, before Larrey's ambulance made its appearance. A long, narrow caisson called a "Wurz" containing instruments and supplies sufficient to care for twelve hundred wounded, was drawn by six horses directly onto the field of battle. Each "Wurz" was manned by eight surgeons, who sat astride the top, and by eight attendants, who had their places on chests behind and in front of the caisson or rode on the horses. Stretchers were carried under the driver's seat. This equipment covered the ground with the speed of field artillery and approached the firing line. While a decided step forward as regards rapidity, cooperation and efficiency, it did not, however, provide for prompt transportation of the wounded from the field.

Larrey took his cue from the so-called "artillerie volante." Each corps, under the control of the chief surgeon of the army, consisted of units, each made up of a major and two aides, twelve junior surgeons, an administration and a working force of three hundred and forty men and twelve light and four heavy ambulances. The former, light, two-wheeled vehicles drawn by two horses, accommodated either two stretcher or four seated patients. The other type, a somewhat heavier wagon with four light wheels, required four horses, and could take care of four stretcher or eight seated cases. They were all well ventilated and were provided with light springs and well padded mattresses. These vehicles all traveled with the speed of light artillery to within one hundred feet of the firing line even during action and the wounded were taken to the rear. On their return to the field each ambulance carried the supplies required by the surgeons and their aides, operating and dressing the wounded while under fire. The addition of Percy's stretchers to the ambulantes volantes organization constituted a remarkably efficient machine and was one of the great achievements of Larrey's life.

The scheme was first tested at the battle of Metz in 1793 and met with unqualified success. Its efficiency may be estimated by the fact that at Aboukir none of the French wounded were on the ground more than forty-five minutes and that at Austerlitz, the bloodiest battle of Napoleon's history, all the wounded, friend and foe alike, were operated upon, their wounds dressed and in the hospitals in less than twenty four hours. When Napoleon became commander-in-chief he was so impressed that he warmly commended Larrey and not infrequently reviewed this important division of his wonderful army.

Larrey's treatment of the wounded was radical and diametrically opposed to precedent. It was usual at that time not to amputate any limbs torn by cannon or musket shot, mangled though they might be, before the lapse of several days. By that time infection, almost without exception, had set in, the patient was weakened by loss of blood and toxic absorption, his resistance was lowered and the prognosis was, of necessity, very poor. At Dettingen, for example, the English did not begin to amputate before the end of the tenth day. Faure reported that three hundred amputations had been done at Fontenay after ten days, and only thirty survived, a mortality of 90 per cent. Faure's practice had been approved by the Royal College of Surgeons as the accepted method and the Royal Academy turned a deaf ear to any papers or persons questioning the doctrine of secondary amputation. Circumstances forced Larrey to perform primary amputation, that is, amputation immediately following the injury, in seven cases at the battle of Alsez in the Palatinate, March 30, 1793; and all recovered. The idea of primary amputation was not original with Larrey but he was the first of the European military surgeons to advocate the method. He found that immediately following the injury the limb was nearly always numb and flaccid, pain had not yet made its appearance and the patient was usually torpid. Only in a few cases was the loss of blood excessive. In most cases the patient was in better condition following the operation than before, as removal of the shattered limb diminished the area over which circulation was required and the blood pressure rose rapidly. Amputation having been done in healthy tissue the blood vessels contracted and there was little if any trouble due to secondary hemorrhage. The femoral artery was always ligated preceding disarticulation of the hip, the necessary incision being made just below Poupart's ligament. The edges of the stump were not sutured but were pressed tightly together, covered with a piece of clean, perforated linen and held together with a roller bandage. Any drainage from the wound escaped through the holes in the linen and was caught by linen or tow saturated with alcohol. The whole was bound firmly to the body. The dressings were kept moist, a treatment not unlike the tissue lavage method of today. Larrey oppossed anything suggestive of meddlesome surgery and in case the dressings did not become offensive or foul often did not disturb them for a week. In many cases the wound had healed when the dressing was first removed. If, however, infection occurred the covering lint or tow, saturated with the foul discharge, was removed and the surface of the perforated linen was carefully wiped with Labarraque's solution (liquor sodae chlorinatae) a term peculiarly familiar when we recall the formula of Dakin's solution. Wounds displaying only a profuse discharge were similarly treated except that saline solution was used instead of the strong antiseptic. The actual cutting time in performing these amputations was incredibly short: eleven seconds for a shoulder and thirteen to fifteen seconds for a hip disarticulation. Larrey emphasized the importance of a very sharp knife, not only because it facilitated the work but also because he insisted that the pain was not so great as with a dull instrument. As conditions in the hospitals were rarely better than in the field, most of the operations were performed in the open. And so Larrey worked in a trench at Acre, back of a sand dune at Aboukir, in a barn just back of the line of the Imperial Guard at Eylau and at Essling in a corner of the wood within a stone's throw of the firing line. Wellington saw him out on the battle field at Belle Alliance, or Waterloo, as the English will have it. While doing circular amputations in a few cases, he was one of the earliest to establish the flap method as the proper procedure and utilized it in the great majority of cases. It was also his invariable custom to amputate at once in all cases of gunshot or cannon-ball splintering of a joint, irrespective of weather conditions. At Eylau he worked all day and all night, his feet in snow and ice, with the thermometer below zero; at the Beresina it was four degrees below zero and the snow fell so fast that two men held a cape over the wounded men and the surgeon while he worked. Nor did the age of the patient deter him; he did not hesitate to do a primary amputation of the right knee of General Zagonescheck, then eighty years old, and the general lived to be eighty-seven. He also devised several new operations: the Larrey disarticulation of the shoulder joint, for example; and what today is known as the Lisfranc operation (amputation at the tarsometatarsal joint) was really the product of Larrey's skill and ingenuity. It will probably never be known just how many amputations he did; but at Borodino he did two hundred amputations in twenty four hours, including eleven disarticulations of the shoulder joint, seven of which recovered; at Acre seventy amputations of all kinds were done by him. Fully 75 per cent of the amputations performed by Larrey and his aides recovered, an astonishing figure when it is recalled that this included all causes of death: concurrent injuries, chances and accidents (especially during retreat), and incidental diseases such as typhus, typhoid, scurvy, tetanus etc.

Due discrimination was exercised in the treatment of joint injuries, as Larrey was a strong advocate of excision in proper cases. In Egypt, for example, he resected the head of the humerus in ten instances, in one case removing the end of the clavicle and the acromion process of the scapula as well, an operation previously proposed by Bulguer, chief surgeon to Frederick the Great, and almost universally condemned before Larrey's time. It remained for Sir William Ferguson and Syme of Edinburgh to vindicate Larrey's views.

Not the least of Larrey's heresies was the transportation of the wounded without regard to distance or weather. Circumstances compelled him to do this early in his career and he never forgot the lesson. All the wounded had to be carried from Acre to Cairo, a twenty-six days' march across scorching sands, in ambulances, on camels, on caissons, on officers' horses commandeered by Larrey, on anything that would support the weight of a man and was capable of being dragged. Napoleon himself walked the greater part of the distance, as there were not enough horses and camels to take care of both disabled and well. Yet even on the short allowance of both water and food all but the hopelessly wounded and sick improved during the march. After that experience Larrey never hesitated to have sick and wounded moved to the base hospitals as soon as possible. During the Russian campaign many thousands were thus saved by early removal in ambulances and on horseback, with a mortality of only 9 per cent notwithstanding extreme cold, scarcity of provisions and utter absence of any semblance of proper care and nursing.

As might have been expected a man of as strong convictions as Larrey would have decided opinions regarding treatment of empyema of the chest, a subject of controversy among surgeons for many years. In his time it was not considered good practice to open the pleural cavity; but Larrey not only did not hesitate to drain by incising the thoracic wall but invariably resected portions of the ribs as well in order to make the drainage all the more complete, a practice surgeons of today are learning to copy.

His treatment of burns by forced feeding and stimulation was likewise diametrically opposed to the prevailing views and excited the ridicule and the opprobrium of contemporaneous surgeons who advocated bleeding and a greatly reduced diet; but Larrey's burn patients very inconsiderately continued to improve.

Plain dressings wet with salt solution or alcohol were used by Larrey instead of the popular waxes, oils, greases and other elaborate dressings. Scraping, setons and scarifications were taboo. Cleanliness, simplicity and rest were his trinity in treatment. In short his methods approached modern asepsis, although Larrey never used the word.

A keen observer, he anticipated many later clinicians. He recognized discoloration of the mastoid process as one of the signs of fracture of the base of the skull, even though we today know it as Battle's sign; scurvy he attributed to the excessive dried fish diet customary at that time in Egypt; plica Polonica, a peculiar scalp disease prevalent among the Hebrews of Poland, he found yielded readily to the regular and reasonably frequent application of soap and water; he noted that cortical injuries affect the intellect and that injuries of the base and of the ventricles produce paralysis, also that paralysis may be relieved in many cases by trephining the skull.

Although Kussmaul is generally credited with being the first to make routine use of the stomach tube, Larrey, while in Egypt, fed tetanus patients by a tube passed through the nose. He also used it where the patient was so wounded as to be unable to swallow, as in the case of General Murat, who had been shot through the neck, the bullet entering below the angle of the jaw on the right side, injuring the ninth nerve, traversing the mouth and emerging on the left side in front of the jugular vein. As to other treatments employed, all puncture wounds, irrespective of location and origin, were freely incised and drained; fractures were promptly reduced and immobilized by a fixed apparatus, a fenestra being used in case of a compound lesion. Extension in case of fracture of the neck of the femur was opposed as likely to draw the ends apart and tending to non-union. In gunshot wounds and burns Larrey practised débridement, the value of which treatment we learned anew in the late war. The actual cautery was used in case of hospital gangrene, the glowing iron being applied until healthy tissue was exposed. His notes on frost bite are complete and to the point; he emphasizes that although the men had been exposed to the severest frost and cold for several days, it was not until they were warmed suddenly that pain was first felt. He observed that those that went closest to the fire suffered most and accordingly contended that cold was the predisposing, and sudden application of heat the determining, factor of frost gangrene. Friction of the affected part with snow or melted ice, dry and hot applications to the rest of the body and cordials internally comprised the treatment he followed; in hopeless cases amputation at the line of demarcation was done.

He seems to have been the first to recognize the infectious nature of ophthalmia, the scourge of the army in Egypt. It is said that there were thirty thousand cases among the troops and that, because of Larrey's care and attention, not one lost his sight; an almost incredible statement! His treatise on the disease is still worthy of historic consideration if not of study. Larrey also not only classified aneurysms and suggested a direct relationship between these and syphilis but was one of the first to recommend the use of mercury ointment on the body and soles of the feet for the latter disease.

A few words regarding his writings may not be amiss. Between 1809 and 1812 Larrey published the first three volumes of his "Memoirs de Chirurgie Militaire et Campaignes." The fourth appeared five years later. To the present generation these are the most interesting of his writings. They read more like a diary than anything military. In them he tells of anything that struck his fancy; and apparently he was interested in everything. Nothing escaped his notice. Had he not been such a wonderful surgeon he would have been a renowned war correspondent and reporter. From 1821 to the time of his death medical literature was enriched by many of his contributions. The first three volumes of his "Clinique Chirurgical" made their appearance in 1829; his final publication was "Relation Medicale de Campaignes et Voyages de 1815 a 1840–41."

Larrey was devoted to those entrusted to his care and labored night and day for their welfare. Routing officers out of their snug, warm quarters to provide beds for the wounded meant nothing to him; not infrequently all except those of the highest rank were compelled to walk because Larrey had taken their horses to transport "his children." As already mentioned it is said that Napoleon walked the better part of the way from Acre to Cairo because all horses, camels and other beasts of burden not engaged in carrying or dragging absolute essentials had been levied upon by Larrey to take the wounded with him. He often sacrificed his own horse as well as those of the officers to provide food and broth for those who needed it.

Nor did he hesitate to risk his life for them. At Cairo during an insurrection of the natives the hospital was attacked but Larrey armed all those able to aim a musket or pull a trigger and beat off the mob. The same thing took place during the Peninsular War. During the three days' rebellion that overthrew the government of Charles X the rioters besieged the hospital sheltering his favorites, the remnants of the Imperial Guard. Larrey assumed command of his old comrades, and the hospital did not capitulate. He was ever alert to detect any trickery that would affect the welfare of the men in any way, and was the terror of all army contractors, who could neither bribe, coerce, coax nor intimidate him. Nor was this devotion without its reward. No one in the entire army, not even Napoleon himself, commanded more love or respect than Larrey. That he might live, men willingly laid down their lives. At the Beresina River, for example, he discovered that some necessary and valuable instruments had been left behind and acting on the spur of the moment he went back to recover them. On his return he found there remained but one bridge, filled with a wild, frantic, desperate, fighting rabble, each one bent upon saving himself before that bridge too should be wrecked and he abandoned to a fate worse than death. Larrey despaired of ever reaching the bridge, to say nothing of ever reaching the side of safety, but some of the soldiers recognized him, lifted him up and passed him from shoulder to shoulder until he came to the other side. A few moments more and the bridge was swept away by the Russian artillery fire.

In appearance Larrey was a typical southern Frenchman, short in stature, round-headed, ruddy-faced. Quick in his actions, hasty and voluble in speech, kindly and affectionate by nature, he was endowed with an abundance of good, hard, common sense. In his earlier years he was slim with regular and handsome features but in later life became stout and stocky, and with his three-cornered hat and long, gray overcoat could easily have been mistaken, as indeed he was, for his great captain. Gifted by Nature with a constitution able to endure unusual privation and hardship, capable of withstanding extremes of heat and cold, fired with an indefatigable energy he not only could, but would, labor under the most adverse conditions for incredible lengths of time. Firm and resolute in character, yet modest and self- effacing withal, nothing could swerve him from his duty as he saw it. He apparently did not know the meaning of the word fear and possessed self-reliance without being self-assertive. He was one of the few men who dared contradict and brave Napoleon and one of the fewer still from whom Napoleon would brook opposition.

The most important of his achievements may be summed up as follows:

1. The use of salt solution in simple wounds and of Labarraque's solution in case of infection.
2. Avoidance of all greases, ointments, or elaborate dressings.
3. Avoidance of all meddlesome surgery.
4. Insistence upon rest for all wounds by not too frequent dressings.
5. Resection of ribs for empyema.
6. Supportive treatment for burns.
7. Immediate amputations.
8. Resection in selected cases.
9. Removal of sick and wounded to a base hospital as soon as possible.
10. Ambulances volantes.

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A BRIEF NOTE ON MEDICAL PHILATELY

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POSTAGE stamps, like coins and currency, have until very recently commemorated mainly the rulers, military heroes, political leaders, salient historical events and industries of their respective nations. The beginnings of descriptive biology, as we know, are to be found in the lifelike figurations of animals in motion on the walls of prehistoric caverns or in palaeolithic carvings and etchings on bone and stone; in the bas-relief representations of wild barley (*Hordeum spontaneum*), the date-palm, lions, gazelles, pelicans, mules, cats, dogs and other animals by Egyptians and Babylonians; of squid, oxen and wild-cats on Cretan wine-cups, vases and palace walls; of the animals and plants of the Ægean littoral on Greek coins, gems, vases and friezes. These animals and plants are all identifiable as to genera and species and most of them are still to be found in the same regional areas. *Quâ* "descriptive biology," accurate plastic representation of the different genera and species antedated their literal and textual description (Theophrastus and Aristotle) by many centuries. The earliest bit of sculpture by neolithic man (the Venus of Willendorf) is at once a prehistoric contribution to anatomy, physiology (pregnancy) and pathology (pathological obesity). One of the earliest specimens of Egyptian sculpture *en miniature*, the image of the physician Imhotep, was duplicated more than any other statue of antiquity, rivalling is this regard, the innumerable paintings, engravings and statues of Vesalius, made in the sixteenth century Medicine had ever a prominent place on early coins and medals. Medical numismatics is, in fact, a little science in itself, followed at present by a few experts only. Medical epigraphy has received little attention, except in the *liste raisonnée* of the lamented Raphael Blanchard. Medical philately is only just beginning, but already bids fair to be a subject of growing and going interest to physicians who collect stamps. The opening wedge was the Pasteur stamp, which now runs through the entire postal issue of France. The next step was the handsome issue commemorating the Centenary of the Lisbon Medical Faculty (Regia Escola de Cirugia, 1826) in 1926. In keeping with the new tendency are the Goethe, Schiller, Lessing, Kant and Beethoven stamps of the German Republic and the Berthollet stamp of France. But "counterfeit presentments" of medical men on postage stamps had thus far been conspicuous by their absence; for Pasteur, who perhaps did most for recent medicine, was originally a chemist who became, in time, a micrologist and eventually a practitioner of preventive medicine. The first physicians to appear on postage stamps were, we record with pride, medical officers of armies. In 1927, three stamps bearing the likeness of Dr. Kaczkowski, Surgeon General of the Polish Army in 1831, were issued by the Polish government to commemorate the Fourth International Congress of Military Medicine at Warsaw (July, 1927). A recent issue of the Republic of Panama bears the likeness of the late General William C. Gorgas, Surgeon General of the United States Army (1903–1918) and famous for his epoch-making work in mass sanitation, the elimination of yellow fever and malarial fever from the Canal Zone at Panama, which made the construction of the Canal possible. Two stamps were recently issued by the Egyptian government to commemorate the International Medical Congress at Cairo (1928), one (5 *millièmes*) representing Imhotep, the Egyptian deity of medicine, grasping the *ankh* (*crux ansata*) or symbol of life; the other (10 *millièmes*) presenting a portrait of the Viceroy, Mohammed Ali Pasha, who founded the Medical School of Cairo in 1828. These medical stamps are a sign of the times, an index of the potent agency for civilization which medicine is coming to be and of that broad spirit of international comity (*la grande amnistie* of Renan) long since voiced for science by Pasteur (*La science n'a pas de patrie*) and for medicine by our own Dr. Jacobi: "Aims, methods and persistency are common to the medical profession of all countries. On its flag is inscribed what should be the life rule of all nations: Fraternity and solidarity."

EPILEPSY IN THE LIGHT OF HISTORY

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NEW YORK

PRELIMINARY REMARKS

HISTORICAL data avail little to the reader unless compiled from the original source material. When they thus contain unfailingly the kernel of truth, they become interesting. They grow convincing to any student when the opportunity is offered to examine the original sources.

For that reason I have tested the references to my quotations from an exotic literature. For convenience a short explanation of the references to the oriental literature follows.

HEBREWS. Mishna is a collection of the scriptures of the Old Testament as well as of oral traditions of antiquity, made by Rabbi Jehuda Ha-Nasi at the end of the second century after Christ. A similar collection is the Tosephtha. Scientific discussions during the first centuries of the Christian era grew around the more ancient writings, chiefly preserved as sanitary laws, and were assembled as the Palestine Gemara at the beginning of the third century, equally as the Babylonian Talmud (meaning the same as Gemara) in the fifth century. Mishna and the Babylonian Gemara together are universally referred to under the common name "Talmud." The Midrashim are collections chiefly of interpretations of the laws of the ancient Orientals.

The best known comparatively modern *medical* interpreter of Bible and Talmud is the Spanish scholar Mose Ben Maimon (usually referred to as Maimonides) 1131–1205.

The Greek translation of the Bible, known as Septuaginta (LXX), is older than the Gemara. The later Latin translation is called the Vulgata.

BABYLONIANS. Medical jurisprudence had its inception in Babylon in 2080 B.C. with the Code of Hamurabi. That is also the period which the Babylonian Talmud records. Laws from that code in reference to the epileptic have been preserved and are observed almost literally today. Maimonides has rendered them in Arabic.

EGYPTIANS. The records of ancient Egyptian medicine have been well preserved in that unique document, the Ebers Papyrus, in Egyptian hieratic characters, which the Egyptologist, Georg Ebers, discovered in Thebes during the winter of 1872–1873. It was a solidly rolled sheet (cut up in parts since) of yellow brown paper, the inner bark of Cyperus papyrus, of finest quality, 0.3 m. wide and 20.23 m. long. The writing is exceedingly clear and regular, with a calendar on the back of the first page. Ebers assigned the writing to 1552 B.C., prior to the exodus of the Israelites. Prof. H. Carrington Bolton calls it the earliest medical work extant.[1] Its title, from the German, is "Papyrus Ebers, the Hermetic Writing." It is published with a synopsis of contents and introduction by Georg Ebers and with a Hieroglyphic-Latin glossary by Ludwig Stern, under the patronage of the Royal Bureau of Education in Saxony.[2] The word "Hermetic" refers to the god Hermes Trismegistus of the Greeks as the inventor of arts and sciences; he is the Egyptian god Thuth, or Thoth. The papyrus is one of the thirty-six books of Thoth.

It describes many diseases accurately and shows that the priest-physicians of Egypt were familiar with methods of diagnosis and many of the drugs in common use today. For the most part external diseases are discussed, and in the German translation no reference is found to epilepsy.

HINDUS. Sushruta has left to posterity the most ancient work on medicine of the Hindus. The Sushruta Samhita deals with the origin of the Ayurveda, which means the science of life, and is one of the four Vedas. The Samhita, in the original Sanskrit written at least two centuries before the birth of Buddha (560), describes minutely in 120 chapters the entire field of medicine, obstetrics and surgery. It is to this day "the most representative work of the Hindu system of medicine." Besides an English translation by a native scholar,[3] it is found in the large libraries in a Latin translation, now out of print.

EPILEPSY IN THE OLD MEDICAL LORE

What are the early facts about epilepsy transmitted through reliable records? It would be interesting to learn if there was ever a time at which or a people to whom epilepsy was not known, a question the answer to which I must leave to an expert archeologist. It would seem that up to 1552 (about 3500 years ago), the ancient Egyptians did not know epilepsy, the papyrus Ebers making no mention of it. As early as 400 B.C., Hippocrates knew that "epilepsy wears itself out," as stated in his: "περὶιερῆς νούσου," meaning the seizures of the individual patient. Will the evolution of human pathology eventually tend to wear out epilepsy altogether in the course of generations?

In the Old Testament and in the Talmud, history contains nothing which betrays any real knowledge of physiology or pathology, and, aside from empiricism, the result of keen observation of nature, the art of treating diseases was shrouded in mystery. We find occasional references to various ills which have befallen mankind ever since gregariousness gave the first impulse to the formation of social habits, but particularly to unsanitary sexual habits and sexual perversities. In connection therewith, laws intending to inculcate the observance of hygiene were placed on record; Moses, in particular, appears to have had acumen and extensive experience of some practical value.

Of a healing art in the beginning we can scarcely speak; such as it was, it was in the hands of the Levites, later of the prophets, concurrent with the religious cult, as was customary with all the ancient peoples from the beginning of history. During a still later period, recorded chiefly by the Talmud, the Israelites employed recognized physicians[4] who were all general practitioners, in contrast to the Egyptian physicians who were, as Herodotus relates,[5] all specialists. Also in Homer a similar reference can be found.[6]

References to epilepsy in the ancient Hebrew writings appear only in the precepts of the sanitary law and reveal various interesting superstitions, but also some true facts which had been recognized at least 2000 years before

Christ, when many Israelites stlli remained among the agricultural tribes of Asia Minor. The Jews then, in their language, referred to the epileptic as *nikpheh*, the bent one. The Old Testament, in relating the story of King Saul, uses the Hebrew word falling, *nophel*, the present participle of the verb *naphal*, to fall (also the Arabic word). For this information I am indebted to the Berlin scholar and physician Dr. Julius Preuss, from whose elaborate work[7] I have translated:

> The description of the seizure is distinct enough in the Gospels . . . When the spirit ("aura" in the Vulgata), πνεῦμα, corresponding to the Hebrew "ruach," seizes him, the patient screams suddenly, falls down and rolls on the floor, foaming and gnashing his teeth, and frequently it has thrown him into the fire or water so that it may destroy him . . .
>
> As cause of the malady is mentioned improper behavior during cohabitation, but it remains equivocal, as so often in the Talmud, whether or not rather a warning *against* improper conduct was intended, and a threat of eventual serious illness of the progeny. There was, for instance, a teaching: Who stands naked in front of a burning light, will become epileptic, and who cohabits with a light lit, will beget epileptic children . . .
>
> When a child, younger than one year, is lying at the feet of the couple during coition, it will become epileptic.[7a] . . . Also when the parents cohabit in the chamber where the handmill is going, on which always a number of women are busy, the children become epileptic.[7b,8] . . . Also coitus immediately after defecation.[7c] . . . or after bloodletting[7d] had the same consequences for the children . . .
>
> Similarly, through a coitus with the husband lying on his back (recumbente marito).[7e]

The Koran threatens with epilepsy those who thrive by usury.[7f]

The Midrashim contain one of the oldest collections of sanitary laws, older than the Talmud or the Old Testament. They report that the "amulet" (charm) in the form of a written *bon mot*, or of some dried roots, was carried on a little chain or in a signet ring not only "by one who was epileptic, but also by one who intended to protect himself against this evil."

That there existed also some exact knowledge appears from the prohibition to marry a woman from an epileptic family, because epilepsy was considered hereditary.[7g]

Some definite legal precepts were observed in dealing with the epileptic: "As priest, the epileptic was declared unfit forever, even when he had had only one seizure." Compare this with the customs of the pythonesses at Delphi (p. 456).

> Epilepsy, as long as possible, was respected as a "secret fault" in the woman, as much her private concern as her period of menstruation; however, should an epileptic woman marry, the contract became void and the marriage was annulled later when the disease became manifest. Repeated attacks at irregular intervals belong to the class of "manifest faults" which must be declared and investigated before the marriage is contracted.[7h]

The history after the Talmud laid great stress on the legal testimony rendered by epileptics. In substance, the Hebrew law remained unchanged through the ages:

> As long as attacks occur, an epileptic is not admissible as witness, whether the seizures happen only at certain definite periods, or perpetually without any fixed type. On the contrary, when the epileptic

is "healthy" [*gesund*], he may testify, provided that his mind is truly and perfectly clear; because there are epileptics whose reasoning powers are disturbed even when they are "healthy" (free from seizures). It is therefore necessary to examine the testimony given by epileptic persons with particular care.[71]

From the ancient Hebrews also the custom was derived of regarding an epileptic as sacrosanct, which is one of the reasons that the disease was known as the "holy illness," *morbus sacer*, ἱερὴ νούσος. Another reason was that the pythonesses, the priestesses who gave oracular answers at Delphi, threw themselves into epileptiform convulsions in the performance of their sacred duties.

Malum comitiale is the term used by the ancient Romans from the custom of suspending the comitia when a man was smitten with epilepsy during the assembly. The modern medical term "epilepsy," from the Greek verb ἐπιλαμβάνειν, to seize, was not used before the tenth century, when it appeared first in Avicenna's texts. Neither was Επιληψία used by Hippocrates or by Galen.

Next in the chronological order is the historical account of Sushruta. I quote the translator:[3]

> APASMÁRA. A disease in which an individual loses the faculty of past cognitions.
>
> Causes: Excessive, inadequate and improper attention to the objects of the sense as well as to their actions, partaking of filthy, impure, incompatible and uncongenial articles of food and regimen of conduct, repressing of any natural urging of the body or aggravation of the Rajas (moral love, spiritual affinity in the psychic) and Tamas (nescience), or going in unto a woman in her menses, or indulgence in amorous fancies, fright, anxiety, anger, or grief, leads to an aggravation of the bodily Doshas (humors) which in their turn affect the mind very greatly and give rise to apasmára.
>
> Description: The sense-carrying Srotas (channels) of the body overwhelmed by the concerted action of the deranged Doshas bring in a predominance of Rajas and Tamas causing (in the meaning of: making) the patient *unconscious* and forgetful of all past memories. He writhes in agony and throws his hands and legs in convulsive jerks, with contracted eyes and eye-brows. He gnashes his teeth, with foams at the mouth, and falls to the ground with open eyes, the consciousness returning a short while after.
>
> The disease is called apasmára which is classified into four distinct types: viz. Vátaja, Pittaja, Kaphaja and Samipátaja.
>
> Premonitory Symptoms: The throbbing of the heart, emptiness or lightness (of the chest, i.e. a sense as if the external world is vanishing away fast), perspiration, pensiveness, fainting, stupid appearance and sleeplessness are the symptoms which are usually found to usher in an attack.
>
> Symptoms: In the Vátaja type of apasmára the patient fancies that a dark supernatural being is coming after him to seize his person, and is frightened and faints in consequence, with shivering, grinding of the teeth, i.e. "lock-jaw," labored breathing and foaming at the mouth. Fainting is excited by a terror of being seized by a yellow and fierce-looking being in the Pittaja type which is further marked by thirst, increased heat of the body, perspiration, fainting, mild tremor of the limbs and restlessness.
>
> In the Kaphaja type is added exhibition of such symptoms as shivering, nausea, sleepiness, falling prostrate on the ground and vomiting of mucus. Pain in the heart, thirst and nausea are the specific characteristics of the three types respectively. But delirious talk and making of indistinct and moaning sounds are present in all the types.

The specific features of all the three foregoing types manifest themselves in a concert in a case of Samipátaja type.[3a]

Discussion on its cause: The sudden appearance of the disease without any apparent cause and also its sudden spontaneous disappearance after a short while without any apparent treatment, have induced several medical authorities to hold that apasmára is not due to any aggravation of the Dosha.

Here follow (in the original) some pretty speculations, however without any medical meaning. Otherwise this is the most carefully written medical treatise of remote antiquity that I have read so far.

"Treatment" is also diligently adapted to the various "types," but is wholly fanciful. Bile of a lizard, a mongoose, an elephant, a special deer, a bear, cooked in oil, are recommended. "Clarified butter, duly cooked with goat's urine and numerous herbs" are prescribed for a special type. "Strong emetics and purgatives" are the only remedies which might be compared to modern principles. Under "general treatment" exercise, hygiene and diet are recommended and it is stated: "Venesection [in the forehead] as recommended before [in the book on surgery] should be resorted to and prophylactic and auspicious articles should be used by the patient."[3b]

GREEKS. That the physician as a healer was always held in high regard by the Greeks all know from the familiar quotation from the Ilias: "Ιητρὸς γὰρ ἀνὴρ πολλῶν ἀντάξιος ᾄλλων."

Homer, in his epics dealing with the Trojan war (1193–1184 B.C.), mentions many times wounds and their treatment in battle, but Daremberg in his monograph, "La Médecine dans Homère,"[9] could find only one reference to *internal* medicine which he defends against the claim of the French surgeon, Joseph Francois Malgaigne (1806–1865), that the Greeks of Homer's time knew nothing of internal diseases.

It is a mythological tenet that the gods and godesses of ancient mythology were the patrons of the healing art and were also able, when angry, to produce disease. Apollo was recognized as the god of medicine as well as music, and he was supposed to look after the health of all the other gods. Asklepias (Aesculapius) was one of his sons; and after him the priests of Asklepias' temple, whose business it was to reconcile the gods by sacrifices, were known as Asklepiads.

Pythagoras, "a famous Greek philosopher, born in Samos about 532 B.C. exercised an early and lasting influence upon medicine" (Dorland).[10] He was the founder of the healing art among the Greeks and had obtained his philosophy from the Brahmans of India. Circulation of the blood was known to the ancient Hindus; the atomic theory was preached in the valley of the Ganges 500 B.C. Galen became the interpreter of Pythagoras.

Aëtius, a Greek medical writer about 500 A.D., the author of a medical work in sixteen books, the tetrabiblon, mentions epilepsy as "morbus Herculi," perhaps because Hercules was afflicted with it, according to a passage in Sophocles' "Trachin" (verse 780), or because this illness was as indomitable as the hero himself according to Galen's commentaries on Hippocrates.

From none of the very ancient writings from the time of Suśruta do again we learn so much about epilepsy, until the "Father of Medicine" describes it in the same lucid way which characterizes all his descriptions from personal experience. Garrison[11] says of Hippocrates (460–370 B.C.):

> The Law, the Oath and the discourse "On the Sacred Disease" are the loftiest utterances of Greek medicine. The argument of the latter treatise, which deals with the supposed divine origin of epilepsy, was the highest reach of free thought for centuries, and had it been heeded, would have done away forever with the foolish idea that human ills are caused by gods and demons.

Plato still refers to epilepsy as the "divine" disease, while Martin Luther, the reformer, called it "morbus demoniacus."

Hippocrates states the faith of his time in his treatise, περὶ ἱερῆς νούσου[12] "De Morbo Sacro," by reference to the several gods who were held responsible for the disease. He then repudiates by numerous arguments the theory that epilepsy is more due to the wrath of the gods than any other human ill. That he diagnosed it correctly appears from his description:

> If they [the epileptics] imitate the goat,[13] or grind their teeth, or if their right side is convulsed, they say that the mother of the gods is the cause.[14] But if they speak in a sharper or more intense tone, they liken this state to a horse, and say that Poseidon is the cause. Or if any excrement (feces) be passed, which is often the case, owing to the violence of the disease, the appellation of Enodius is adhibited, but if it be passed in more liquid excrements and more frequently like those of the birds, it is Apollo who provokes it. But if foam be emitted by the mouth, and the patient kick with his feet, Ares (Mars) gets the blame. But terrors which happen during night [*pavor nocturnus*], and fevers and delirium, and jumpings out of bed, and frightful apparitions, and fleeing away, all these they hold to be plots of Hekate . . . It is curable, unless, when from length of time, it is confirmed and has become stronger than the remedies applied. Its origin is hereditary.[12a] . . . The man loses his speech and intellect, and the hands become powerless, and are contracted . . . and the eyes are distorted owing to the veins being excluded from (breathing) the air and froth from the lungs issues from the mouth. He foams and sputters like a dying person. When adolescent, they recover without leaving any mark of the disease, but there is danger of its becoming habitual, and even increasing if not treated by suitable remedies.

LATER HISTORICAL RECORDS

To the early facts known about medicine and transmitted to posterity by script, symbol and sculpture, little new was added of historical value after the third century of the Christian era for more than a thousand years. A book "On Ancient Medicine" has been found among the voluminous writings of Hippocrates, and Galen (130–201 A.D.), who wrote numerous original works on anatomy, besides books on natural science and philosophy, was the last one of his generation to contribute actual new knowledge to the medical lore. To his "Commentaries" on Hippocrates the history of medicine owes most of its early material.

Aurelius Cornelius Celsus, a celebrated Roman physician of about 25 A.D., has written very little on epilepsy. Epileptics are compared by him and likened to individuals in lethargy, and human blood is recommended as having curative value. That he could not have given much thought to the subject would appear from his advice to let the patient go without food for three days after a seizure, as though there were not many patients having daily attacks!

Aretaios, a famous Greek physician born in Cappadocia, belongs to the second century after Christ, but was not mentioned until the sixth century by Aëtius of Amida and the Byzantines. Aretaios was an excellent observer and left an exemplary description of epilepsy in which he made the first mention of the "aura." He taught that the function of the cerebral nerves is "crossed."

Coelius Aurelianus (490–583) added new traits to the history of the prodromes, regarded the disease in its relations to hysteria and for the first time, in his book, mentioned an apoplectic variety, in which the syndrome resembles sleep. None before him had discussed the therapy with more thoroughness and understanding. His chapter on treatment is more complete and instructive than the writings of authors centuries later.

In Aëtius (about 500 A.D.), who has previously been mentioned, we find reference to the treatment of epilepsy incidentally. He regarded extirpation of the testicles (which had been known to cause many cases of "permanent" epilepsy) as an "infallible cure," a *simile similibus* principle.

ARABIANS. No original contributions to the knowledge of epilepsy were made by the Arabian writers, among whom Rhazes, Avicenna and Averroës were best known. Rhazes (850–932) stressed the different varieties of epilepsy; Avicenna (Arabic, Husain ibn Abdallah; Hebrew, Aven-Sinâ; Latin, Avicenna) (980–1037) emphasized the toxic etiology.[15] In the treatment he recommended abstinence from wine and the most scrupulous sobriety. Averroës, a distinguished Spanish-Arabian philosopher and physician (1126–1198), borrowed most of his remarks and deductions from Aristotle and Galen.

1500–1756. After these writers, science remained stationary until three centuries later, when the Frenchman Jean Fernel, "the modern Galen" (1497–1558), gave a thorough account of epilepsy. He was the physician attending upon Catherine de Medici. A judicious scholar, able writer, profound philosopher, this independent thinker produced a most complete treatise on epilepsy and differentiated with precision the various categories of the disease. His valuable consultations give an idea of the intelligent principles and rational clinical deductions upon which Fernel based his therapy.

Most of the references since then in Sprengel's "Histoire de la Médecine"[16] go to exemplify the almost complete ignorance which prevailed through the centuries. Jean Concorregio of Milan, an Arabist, practiced in 1404 in Bologna and later in Pavia and Florence, in 1439 in Milan. He mentions a case of epilepsy "in which the patient did not fall, but was able to hold himself upright," probably an equivalent.

Also in the fifteenth century, Antoine Guainer of Pavia recommended in epilepsy, apoplexy and mania cauterization by means of chemical caustics. He says in relation to convulsions that they "produce fever by placing the patient between two fires." The meaning of this passage remains obscure.

At about the same period of time the Japanese applied the moxa, "a tuft of soft, combustible substance to be burned upon the skin" (Dorland),[10] of plant origin[17] as a cautery on the head "et lavent avec de l'eau salée la partie qu'ils ont cautérisée" (and wash with salty water the part which they have cauterized).

Next we hear about epilepsy from Theophrastus Bombastus von Hohenheim, known as Paracelsus (1493–1541), who wrote in German and Latin.[18]

From one title: "Morborum capitalium quattuor, sc. Epilepsiae, Podagrae, Paralysis et Hydropis curae verae," we may see that Paracelsus believed in a cure for epilepsy.

Next in chronology follows Alsario della Croce (Vincento, Genuensis):[19]

Jean Baptiste van Helmont, pupil of Paracelsus (1577–1644) left a volume of 700 pages[20] published after the author's death.

Johannes Schröder wrote on epilepsy in a work published in 1648.[21]

August Petraeus published a translation of Albini's "Von der Entzückung oder Hinfallung"[22] (the same as the Italian *caduco*, referred to previously).

That the "irregulars" were also interested in the publication of their exploits would appear from the following dilatory announcement: "Gualth. Ryff, Neu erfundene heylsame und bewährte Artzney, gewisse hilf vnd radt, mit allem in die Frantzosen oder bösen blattern [meaning syphilis], sunder auch andere sorgliche schwere Krankheyt mängel vnd gebrechen zu vertreiben, heilen vnd curieren, mit vormals unbekannter, vnd bis auf diese zeit vnbewisster bereytung, gebereytung, gebrauch vnd wurckung des Indianischen holtz Guiacum oder Frantzosenholtz genennet."[23]

Daniel Sennert (1572–1637), professor at the German University of Wittemberg, the first one to give an unmistakable description of scarlatina, although a chemist was also a believer in witchcraft and revived the belief in demons. No wonder that he attributed to magnets a favorable influence upon epilepsy. In his writings appears also for the first time an attempt to answer the question whether animals were subject to epileptic seizures. His affirmative answer he supported by evidence from numerous authors, which claimed that the quail, the lark, birds of prey, the magpie, the jackdaw, the partridge, the sparrow, the goat, the sheep and the dog could be afflicted with epilepsy.

Chemical treatment was introduced, supposedly with success, in the sixteenth century. Alexander Suchten (from Danzig) wrote: "De secretis antimonii,"[24] a pamphlet which contains, besides, two treatises by Phaedro, "Epilepsiae curatio et Pestis epidemiae curatio," and, by Paracelsus, "Liber de narcoticis aegritudinibus." In the seventeenth century quinine was used against epilepsy, as was also zinc oxide which is still used today in the treatment of epilepsy. Ammonium and copper hydrochlorates were introduced into the treatment in 1756 by the French.

Trepanation has been practiced since ancient times, and is still the key to modern brain surgery.

EPILEPTICS OF HISTORY AND LITERATURE

It remains to examine the traditions and historical, particularly biographical, facts referring to historical and other celebrities afflicted or stigmatized with epilepsy.

JULIUS CAESAR. In the introduction to Julius Caesar of the "New Hudson Shakespeare,"[26] is mentioned an English translation from the Greek of Appian of Alexandria, published in London in 1578. Among the marginal summaries in Appian, one reads: "Caesar has the falling-sickness" (German, *Fallsucbt;* Latin, *Morbus caducus*).

From Thomas North's translation of Plutarch's "Lives," first printed in 1579 and dedicated to Queen Elizabeth, I quote as follows:

> Thereupon Caesar rising departed home to his house; and tearing open his doublet-collar, making his neck bare, he cried out aloud to his friends, that his throat was ready to offer to any man that would come and cut it . . . Afterwards, to excuse his folly, he imputed it to his disease, saying, that their wits are not perfect which have this disease of the falling-evil.[27]

The Roman historian Suetonius in "The Twelve Caesars" speaks of two distinct epileptic seizures of Caesar sufficiently important for contemporary history to have taken notice of them: one at Cordova, before the battle of Pharsalus, the other at his victory of Thapsus in Africa. He states in addition that Caesar was exempt in his youth. Plutarch records that at Thapsus Caesar had premonitory symptoms and, shaken with tremblings and feeling the aura, had barely time to be carried into a tower, where the seizure overtook him. The premonitory symptoms were tingling and trembling lodged in one of his feet, which subsequently he felt rising the whole length of his body, and when they reached his head, he lost consciousness.[25]

Barois[28] comments that the probability of vertigo and tenacious headaches, transitory amnesias and somnolency cannot be doubted, and quotes another French investigator who suggested that "these symptoms make him think of the possibility of an encephalitic compression in the paracentral regions, of a syphilitic character." . . . "The husband of all the women in Rome."

MAHOMET, THE FOUNDER OF ISLAM. A Jew, Ishmael, and the daughter of a reigning Arabian prince became the progenitors of the Arab tribe from which Mahomet descended. The founder of the faith of Islam was born in Mecca in 569 of the Christian era.[29] His grandfather had been the guardian of the Caaba, which privilege remained in his family. "In religion the Arabs, in what they term the days of ignorance," says Washington Irving,[29a] "partook largely of two faiths, the Sabean and the Magian, which prevailed at that time over the eastern world." The Sabean was the religion of Abraham," inculcating a belief in the unity of God—this religion lost its original simplicity and purity, and became obscured by mysteries and degraded by idolatries." The Magian was the religion of Zoroaster, recorded in the Zendavesta, the belief of the Persians in one supreme and eternal God. "Of these two faiths the Sabean was much the most prevalent among the Arabs, but in an extremely degraded form. The Christian religion had likewise its adherents among the Arabs." Judaism with its rites, ceremonies and traditions had also an influence. To Mahomet is ascribed by one of his earliest biographers, the Arabic historian Abulfeda, "a turn for reverie and religious speculation which he had evinced from his earliest years."

Mahomet became versed in the Arabic texts of the Old and New Testaments, also in the traditions of the Mishna and the Talmud.

> The knowledge thus variously acquired and treasured up in an uncommonly retentive memory, was in direct hostility

to the gross idolatry prevalent in Arabia and practiced at the Caaba. It appeared to Mahomet that the time for another reform was again arrived. The world had once more lapsed into blind idolatry. It needed the advent of another prophet. The probability of such an advent with its attendant reforms, seems to have taken possession of his mind—he gradually absented himself from society, and sought the solitude of a cavern where he would remain days and nights together, engaged in prayer and meditation. In this way he always passed the holy month of the Arabs. Such intense occupation of the mind on one subject, accompanied by fervent enthusiasm of spirit, could not but have a powerful effect upon his frame. He became subject to dreams, to ecstasies and trances. Often he would lose all consciousness of surrounding objects, and lie upon the ground as if insensible. Cadijah (his wife), who was sometimes the faithful companion of his solitude, beheld these *paroxysms* with anxious solicitude, and entreated him to know the cause; but he evaded her inquiries, or answered them mysteriously. Some of his adversaries have attributed them to epilepsy, but devout Moslems declare them to have been the workings of prophecy.

In one of those retirements, during the holy month, "in the fortieth year of his age," says Washington Irving, he had the revelation which made him the prophet of Islam. Here the author adds a footnote:

> Dr. Gustav Weil [whom he also refers to in the preface as the "very intelligent and learned librarian of the University of Heidelberg"] in a note to "Mohamed der Prophet," discusses the question of Mahomet's being subject to attacks of epilepsy; which has generally been represented as a slander of his enemies and of Christian writers. It appears however to have been asserted by some of the oldest Moslem biographers, and given on the authority of persons about him. He would be seized, they said, with violent trembling, followed by a kind of swoon, or rather convulsion, during which the perspiration would stream from his forehead in the coldest weather; he would lie with his eyes closed, foaming at the mouth and bellowing like a young camel.[30] Ayesha, one of his wives, and Zeid, one of his disciples, are among the persons cited as testifying to that effect. They considered him at such times as under the influence of a revelation. He had such attacks, however, in Mecca, before the Koran was "revealed" to him . . . He did not like that any one see him during these paroxysms . . . He said: "Sometimes I hear sounds like the tinkling of a bell, but see nothing." [Hallucinations.]

To this Washington Irving adds in parenthesis: "A ringing in the ears is a symptom of epilepsy." The first three years of his great "revelation," Mohamet met with much opposition which "preyed upon his spirits, and increased the perturbation of his mind. He became worn and haggard, he was accused of mental hallucinations."

Washington Irving gives a complete pen picture of the physical appearance and character of Mohamet "according to accounts by his contemporaries:"

> His intellectual qualities were undoubtedly of an extraordinary kind. He had a quick apprehension, a retentive memory, a vivid imagination, and an inventive genius. Owing but little to education, he had quickened and informed his mind by close observation, and stored it with a great variety of knowledge concerning the systems of religion current in his day, or handed down by tradition from antiquity. His ordinary discourse was grave and sententious, abounding with those aphorisms and apologues so popular among the Arabs; at times he was excited and eloquent, and his elo-

> quence was aided by a voice musical and sonorous. He was sober and abstemious in his diet, and a rigorous observer of fasts . . . "There are two things in this world," would he say, "which delight me, women and perfumes." His passion for the sex had an influence over all his affairs. It is said that when in the presence of a beautiful female, he was continually smoothing his brow and adjusting his hair, etc. . . . He was naturally irritable, but had brought his temper under great control . . . we have shown his enthusiastic and visionary spirit gradually wrought up by solitude, fasting, prayer and meditation, and irritated by bodily disease into a state of temporary delirium, in which he fancies he receives a revelation from heaven. We cannot but think there was self-deception in this instance; and that he believed in the reality of the dream or vision . . . We find him repeatedly subject to trances and ecstasies in times of peculiar agitation and excitement. The general tenor of his conduct up to the flight from Mecca, is that of an enthusiast acting under a species of mental delusion. . . . He was, undoubtedly, a man of great genius and a suggestive imagination . . . in a great degree, the creature of impulse and excitement, and very much at the mercy of circumstances.

The writer ends his volume with these words:

> We find no other satisfactory mode of solving the enigma of his character and conduct, than by supposing that the ray of mental hallucination which flashed upon his enthusiastic spirit during his religious ecstacies in the midnight cavern of Mount Hara, continued more or less to bewilder him with a species of monomania to the end of his career and that he died in the delusive belief of his mission as a prophet.

He died in 632, sixty-three years old.

In defence of Mohamet, Karl Pelman urges:[31]

> Mohamet suffered from delusions, which occurred in paroxysms and were associated with convulsions . . . but the prophet dictated, closely following the seizure, the suras of the Korán as communicated to him by the angel Gabriel during the seizure. With the character of Epilepsy this cannot be reconciled.

However, one must compare the mental content of numerous suras with the original.[32]

KING SAUL. While the historical references to the persons previously discussed are fairly convincing, the case of King Saul according to the Scriptures seems less obvious. Julius Preuss has made a careful study of the original texts and arrived at these conclusions: Quoting 1 Samuel[7j] XIX, 24: "And he stripped off his clothes also, and prophesied before Samuel in like manner, and fell [the correct translation of the Hebrew word *naphal*] naked all that day and all that night," Preuss interprets this as "frequent epileptic attacks."[7k] This happened at Naioth, where Saul had gone to meet David. The facts related were these: "Saul sent messengers to fetch David from Naioth. They met a number of prophets who spoke queerly (μαινεσϑαι) and themselves suffered a 'psychic infection.' Finally Saul himself went after them and he walked 'speaking peculiarly' as far as Naioth. Then he undressed and "naked fell all day and all night." "Such frequent epileptic seizures in short succession (status epilepticus) would hardly appear" says Preuss, "without previous occasional epileptic attacks or at least equivalents. It is therefore probable that 'the evil spirit' from the Lord which overcomes him suddenly represents an epileptic equivalent and that also the peculiar speech (μαίνεσϑαι) must be understood as an epileptoid condition."[7k]

It is also significant that King Saul asked David, who was triumphant over him as pretender to his throne, but treated the king generously: "Swear now therefore unto me by the Lord that thou wilt not cut off my seed [destroy my descendants after me]."[7l]

Although Preuss does not favor the interpretation which diagnoses Saul's depression, well founded on historical events, his periods of melancholy, as "idiopathic psychosis," he admits that epileptic insanity is manifested when he sends messengers to fetch David and in the subsequent events at Naioth.

"Saul took a sword and fell upon it." He kills himself after he has lost his battle and his throne.[7m]

KAMBYSES. Another instance of an epileptic king is Kambyses, son of Cyrus, Persian king 529–521 B.C. "Granted that the opinion judging Saul as an epileptic is correct, the clinical picture shows a surprising similitude with the one which Herodotus draws of Kambyses." As J. Preuss quotes:[7n]

> It is said of him expressly that he had suffered of the morbus sacer . . . What appears different about Kambyses from Saul is the cruelty which, even for an oriental despot of an unheard-of brutality, yet not motivated by any political reasons, reminds severely of the Caesarean mania of Roman emperors.

ST. PAUL. Prof. A. Seeligmüller,[34] succeeds in a brilliant refutation of the arguments of Max Krenkel[35] showing that St. Paul, the apostle, was *not* an epileptic. After drawing a vivid pen picture of epilepsy from his rich experience, this author defeats Krenkel with his own words. Krenkel, in one of his many writings on the apostle Paul, had characterized him first as to his *intelligence* as a man of mental and intellectual power and of facility of speech, second as to his *disposition* (*Gemüt*) of magnificence of character and sacrificial love, unselfish and energetic, and third, as regards his *energy*, he praises his energy of volition, calls him a hero of action and a prudent general as well as a "hero of true spiritual grandeur, of mental superiority, full of genial force, and praises him as a religious genius of historical significance, carrying a rich treasure in that earthen vessel, his debilitated body."[34]

Despite all this favorable characterization, Krenkel wants to make him out an epileptic! With this Seeligmüller compares the qualities of the epileptic and asks, first; have the intellectual powers of the apostle decreased and second, if so, at which period of his life? The vision of Damascus took place in 35 A.D.; in 53 Paul wrote his epistles to the Romans; in these eighteen years undoubtedly *no* mental deterioration has occurred. Seeligmüller quotes also the German, Wernle: "Paul a peaceful artisan and industrious tentmaker, and the greatest psychologist of antiquity." Again, he quotes Baur,[36] saying: "Of innate, rational, thoughtful deliberation." While Krenkel in his previous writings had designated Paul as a man "of discerning mentality and equipped with the victorious power of dialectic," he wants, later, to find in him mental defects and blundering speech. Seeligmüller points out Paul's universal love in contrast to the egocentric character of the epileptic, his tender thoughtfulness over against brutal viciousness, his modesty and humility over against insulting inconsiderateness, a conciliatory spirit as against an emphasizing of the epileptic personality. He was continually joyous and adaptable, disregarding his own person, in contrast to the sullen, morose and useless epileptic.

Seeligmüller then takes up the eight flimsy arguments dragged in by Krenkel to make out his case: (1) the "σκόλοψ" he compares with Mark IX, 20 which shows distinctly the symptoms of epilepsy in a boy brought before Christ, but nothing in the least to compare with Paul's case; (2) regarding the "morbus qui sputatur:" spitting out in front of an epileptic is of no consequence and as likely in other circumstances. Of a supposed "eye disease" there can be no question. A dimmed vision immediately before a seizure, and vibration of the eyelids, is all, but may occur during any excitement. (3) The visionary paroxysms, "ὀπτασίαι και ἀποκαλύψεις τοῦ κυρίου" (visions and revelations of the Lord) and the vision on the way to Damascus, thought equally an epileptic manifestation, are without force of evidence as such. Even under an equivalent the memory is usually completely gone. But Paul reports the events of that day with surprising clarity. (4) Paul is supposed to have refuted the insults and profanities of his adversaries, "because they had observed him in seizures at Corinth and called him "ἄφρων" (demented). There is nowhere evidence for this on record. Krenkel himself attributes to Paul "facility of speech." (5) The "debility, oppressiveness and anxiety" mentioned are physiologically natural, as Paul was to preach to the cultured Corinthians. (6) The "having shorn his head in Cenchrea"[37] interpreted as "a medical measure" has no foundation, but is a fabrication. (7) The apocryphic description[38] of Paul's appearance as well suited to an epileptic would mean: Because the apostle had an infirm, unbeautiful body, he *must* be an epileptic; which is simply absurd. (8) Like other epileptics of history, Paul was far above the average in intellectual power. Krenkel mentions here among the great men who suffered from epilepsy Kambyses, the Persian king; M. Livius Drusus, Roman tribune; C. Julius Caesar; Himerius, an orator of renown; Mahomet; Charles V; Alfred the Great; the Turkish captain Turun; Ferdinand V, the Catholic; George Fox; Peter the Great; Napoleon I; Archduke Charles of Austria. Krenkel's justification in these cases. is sometimes problematic.[39]

It speaks further in favor of Paul that, when he preached "to the unknown god" at Athens and was overwhelmed by the crowds, he had no seizure. During all the dangers of his voyages, he was the one to preserve always courage and presence of mind; in the danger of the shipwreck he saved 276 souls.[40] Finally, during the years of his activity, nothing is said of epileptic paroxysms. Of the other possibilities of St. Paul's sickness, Seeligmüller refers to the probability of his "thorn in the flesh" (σκόλοψ) as "migraine ophthalmique" (Féré).

If the vision before Damascus is accepted as an equivalent, it must have taken the place of a grand mal seizure. But nobody has ever shown that either before or after this "vision" Paul had a single genuine seizure. Wendland, quoted by Seeligmüller, says: "There is no need, considered in itself, to identify the visionary state with an epileptic seizure."

The great Italian poet Dante revealed a strange understanding of the *visions* of Paul the apostle, in his "Divina Commedia," which is psychologically most interesting.[41] Referring to the "Vita Nuova," which is a series of poems, and to "Il Paradiso" also by Dante, Emile Bouillon "intends to throw some light upon Dante's conception of 'visions' in general and the relation of his own vision to that of St. Paul." Quoting from the Vulgata:[42] "Si gloriari oportet (non expedit quidem), veniam autem ad visiones et revelationes Domini." "Scio hominem in Christo ante annos quatuordecim raptum hujusmodi ad tertium coelum; et scio hujusmodi hominem. Quoniam raptus est in paradisum, et audivit arcana verba, quae non licet homini loqui," the author continues: "This rapture was commonly thought to have occurred at the time of Paul's conversion, when he was "three days without sight, and neither did eat nor drink," after having heard the voice of the Lord and seen the great light, on the way to Damascus.[43] The fifth and sixth century work "On the Celestial Hierarchy," ascribed to Dionysius Areopagiticus, was supposed to contain the true account of what Paul beheld, as told to Dionysius by Paul himself. It was so understood by Dante, who, at the end of "Il Paradiso," puts into the mouth of Beatrice the following reference to Dionysius:

> E se tanto segreto ver profferse
> Mortale in terra, non voglio ch'ammiri;
> Chè chi il vide quassü gliel discoverse
> Con altro assai del ver di questi giri.

My translation: And when a mortal (Dionysius) discovered on earth such a secret truth, I don't want you to be astonished. Because the one who saw it here below (St. Paul) revealed it to him with many other truths of these angelic circles (the heaven).

In the "Vita Nuova:"

> We note a persistent effort to exclude every merely external circumstance, in the choice of the matter, that is not indissolubly connected with Dante's psychic history. Every reader is struck by the prominence given to "visiones," and is at first led to suppose that the author dwelt in a world of dreams. They are, however, "voluntary evocations." They form a fundamental part of the author's creative method. When he has chosen his topic, he fixes his mind upon it with such intensity, surveying it in all its aspects and excluding every irrelevant thought, that he succeeds in bringing it before his mind's eye in the shape of a picture or a series of pictures. Even in Chapter XXIII, where the poet is ill and perhaps delirious, the ensuing dream does not crop up unexpectedly from his subconscious, but is deliberately constructed out of his meditations, although, in its later developments, it doubtless passed beyond the control of the fever-stricken youth who called it into being. The "visions" of the "Vita Nuova" are then the visualization of a poetic theme under the stress of mental concentration.

When Dante wrote the "Vita Nuova" he had the plan of the "Divina Commedia" already in his mind. "Il Paradiso" describes the third heaven, the sphere of love where he meets Beatrice. His mind reverts to one who, before him, had visited paradise, St. Paul:

> His own poetic vision was analogous to the rapture of Paul. As his character broadened and deepened, and as religious fervor gradually gained the mastery, in his heart, over earthly love, his likeness to the apostle became more intrinsic, until in the grand final vision of the "Paradiso," Dante may well have felt that the difference between his illumina-

tion and that of Paul was one of degree rather than of kind.

In conclusion, the author offers an interpretation of St. Paul's rapture which is not at all inconsistent with the belief that St. Paul's vision and Dante's contemplation were, in the mind of the great Florentine, essentially alike; both voluntary, both intellectual, both transcending the bounds of ordinary human experience, both realizations of the divine promise: "Beati mundo corde, quoniam ipsi Deum videbunt" (Blessed those of a pure heart, verily they will see God).

THE ROMANCE OF EPILEPSY

For a psychologist who is also a linguist, it is a thankful and interesting study to examine the literature of the great nations (as far as accords with his command of languages) for psychiatric descriptions.

There is a particular reason, and it seems a very good reason, why it is worth while to go to the classical poets and writers of essay and fiction who have made the field of normal and morbid psychology their own, among them Homer, Cicero, Dante, Goethe, August Strindberg, Mäterlinck, Daudet, Balzac, Racine, George Eliot, Hawthorne, and preëminently the Russian Dostoievsky. The ones mentioned are inimitable in their descriptions of psychological situations and some of the psychological phenomena and psychiatric facts which require especially keen observation. They are capable of dressing their observations in language infinitely more attractive than the best medical terminology and, as a rule, the acclaimed authors command a finer diction than most medical writers. Some classics, it is true, have been produced by medical men, one of the best known our own Oliver Wendell Holmes.

DOSTOIEVSKY. One of the greatest writers of the nineteenth century, the Russian novelist Feodor M. Dostoievsky, born in 1821 in Moscow, who was an epileptic, made the field of morbid psychology and psychiatry his own in so unique a way that alienists recognise his descriptions as masterpieces. He described many nervous and mental disorders such as mania and depression, the psychoneuroses, hysteria, obsessive states, idiocy, moral and criminal insanity, alcoholism, the conduct of individuals with personality defects, and particularly epilepsy in all its phases, in such a masterful way that it has never been surpassed in any literature. Evidence of this can be found in all his books, perhaps the one most interesting to the medical specialist being "The Idiot." The quotations I translate from the German.

A brief description may introduce the two chief male characters of this book: In a train running full speed in the direction of Petersburg, Russia, on a foggy November morning, two passengers are sitting face to face, each desirous to speak one to the other and waiting for an opportunity. One is the merchant Parfen Rogoshin, about twenty-seven years old, with curly, almost black hair and small grey, fiery eyes, his nose broad and flattened, his cheek bones prominent. The other is a prince, the last of his line; also about twenty-seven years old, a little over medium height, with very light blond thick hair, sunken cheeks and a small pointed, very blond van Dyke beard. His name is Lyow Nikolayevitch Myshkin, mostly referred to as "The Prince." His eyes are big, blue and calm; in their glance is something quiet, but depressed; that peculiar expression from which some people at the first glance guess that its owner is an epileptic.

In the course of the narrative, he is described as shy, retired, naïve, candid, frank, true-hearted, pure and always very modest in his answers.

The two most conspicuous female characters in the story are Nastasja Filippovna, about twenty-six years old, of exquisite beauty, eccentric, an orphan, raised and later kept by a wealthy merchant; and Aglaja, the youngest of three daughters of a general, a pretty, naïve, but determined young lady.

Myshkin falls in love with Nastasja's photograph, while Aglaja falls in love with him at their first meeting. The more he learns about Nastasja's past, the more he suffers compassion for her, and his love becomes a Platonic compassion.

At a social gathering, one of the guests with whom the Prince was acquainted, addresses him in words which convey an impression of the mental and emotional reactions which must have seized upon him on his return to Russia: "You, a youth, were thirsting after your fatherland as after an unknown promised land. You read many books about it; you arrived with a torrid thirst for activity; you bounced on such activity! And the very first day, one relates to you the story of a dishonored woman. The same day you see this woman, you are charmed with her beauty, a fantastic, demoniac beauty. Add to this your nervousness, your epilepsy, our Petersburg humidity, weakening anybody's nerves; add that you spent that day in a city unknown to you, a fairylike city, with all kinds of people, experienced all sorts of scenes, made unexpected acquaintances, the one of the three beautiful misses Jepantchin, and among them Aglaja; add further your fatigue and your dizziness, and Nastasja Filippovna's salon and the tone prevailing there—and what result could you expect at such a moment regarding yourself?"

After six months' absence from Petersburg, when he had had no epileptic seizures, on alighting from the train Myshkin evinced a strange yearning to go to Rogoshin's house. He perceived himself, however, in great excitement; "He had not expected that his heart would beat so painfully."

Confronted with Rogoshin, the latter noticed his confusion and asked him: "Why do you rivet your eyes on me so fixedly? Why don't you sit down?" The Prince sat down. "Parfen," he said, "tell me candidly, did you know that I would come to Petersburg today?" "I thought that you would come, but how should I know that you would come today?" "But you need not be so irritable." Then Rogoshin: "Why did you ask if I had known it?" "When I alighted from the train a little while ago, I saw just such eyes turned upon me as these with which you gazed at me just now." "And whose eyes were they?" asked Rogoshin. "I don't know; I consider it even possible that it merely occurred to me accidentally. Such deceptions happen to me recently often. I have almost the same sensation, brother Parfen, as five years ago when I had my attacks." He then told Rogoshin how he had recognized the house intuitively as his, but did not know why. "Of course, it is only imagination," he said. "I am actually worried that such things can excite me." Then he asked him: "Will you celebrate your wedding here?" at which Rogoshin started. Then Rogoshin told all his experiences with Nastasja. During their long-continued conversation the prince had absent-mindedly taken a knife which lay on the table, and handled it without knowing what he did. "Leave that alone!" said Rogoshin and tore the knife hurriedly out of his hand. "It seems to me that I had a presentiment when I was entering Petersburg—" continued the prince. "I did not want to come here, I wanted to forget all this and tear it out of my heart! Well, good-bye—but what is the matter?" While speaking, the prince had, in his absent-mindedness, again taken the same knife from the table, and now Rogoshin took it a second time out of his hand and threw it on the table. Not until then had the prince become aware of the knife, and startled he asked: "Do you cut the pages open with it?" "Why, certainly." "Yet, it is a gardening knife!" "Why can I not cut the pages with it?" "But then, it is quite new." Rogoshin: "May I not buy a new knife whenever I wish?" Rogoshin shouted like a madman; he had become more irritable with each word. The prince was startled and looked at him attentively. "We are nice ones," he said with a laugh. "Don't be angry with me, brother, when my head is as heavy as at present, and withal, that sickness—I become confused and queer—I don't even know any more what was the matter. Goodbye." But then, Rogoshin detained him again, took him to other rooms, presented him to his aged mother, who blessed him, and indulged in dilatory philosophical discussions with him. Finally, with a parting embrace, he renounced Nastasja, giving way to a feeling that she must belong to the prince: "Take her, since fate wants it thus! She be yours! I cede her to you!—Don't forget Rogoshin!"

In the afternoon, failing to find at an inn the eighteen-year-old college boy who performed friendly services for him, he started on an aimless wandering throughout the city. "He found himself in a condition of painful tension and unrest; at the same time, he felt a strong desire for solitude." At six o'clock, he happened to be at the railroad station for Z. "The lonesomeness had soon become unbearable to him; a new desire took possession of him with fervent ardor, and for a moment, the darkness in which his soul was merged, was illuminated by a brilliancy. He bought a ticket for Pawlowsk (the General's country place) and waited impatiently for the time of departure; but he had constantly a sensation as if something pursued him and that it was reality, not imagination as he might have been inclined to think. Suddenly, he threw the ticket away and went out of the station, confused and in deep thought. On the street it occurred to him suddenly that something very strange, which had troubled him for hours, became clear to him. Consciously, he caught himself in an occupation which he had continued for a long time, but had not been aware of: namely, for several hours he had begun, time and again, to seek something about his person. Sometimes he had forgotten it again, for half hours, then suddenly he would begin again looking all over for something.

But as soon as he became aware of this morbid, up to now unconscious, impulse in him, another remembrance flashed upon his mind and interested him greatly; he remembered that at the moment when he became conscious of looking for something, he had arrested himself in front of a shop-window and examined the goods on exhibition there. At present, he was anxious to determine whether he had indeed stopped in front of this shop-window, perhaps five minutes ago, or whether it had merely seemed so to him and he had been mistaken. Did this store and those goods really exist? He felt today in an unusually morbid condition, almost as formerly at the onset of his seizures. He knew that, during the onset of his seizures he would be extremely confused, and mistook objects and persons, when he looked at them without close attention. But there was another special reason why he was interested to know if he had previously stopped in front of that shop. There had been an object in the window which he had regarded and estimated at 60 kopeks. That he remembered despite all his confusion; he must have stopped for the sake of this very object. He walked almost longingly looking toward the right, and his heart beat hard with impatient expectation. But there was the store, at last he had found it! He had been already 500 paces away when he resolved to turn. And there was also the article for 60 kopeks. Laughing hysterically, he remembered distinctly how, standing in front of this shop-window, he had suddenly turned around, just as he had done when, some time previously, he had felt Rogoshin's eyes fixed upon him. Convinced that he was not mistaken, he did not interest himself any longer in the shop and left as quickly as possible. Now he became deeply lost in thought of something else. He remembered that in his epileptic condition almost immediately before a seizure (provided it happened while awake) there had been a phase when suddenly amidst sadness and darkness of the soul and amidst depression, his brain had flashed up, as it were, and for moments all his vital forces had become intensified with extraordinary energy. The life sensation and the consciousness of the own personality increased tenfold at such moments which lasted no longer than a flash. Reason and mind were permeated by an unusual light, all his excitement, all his doubts, all his anxieties were soothed at once, dissolved into a superior quiet full of harmonious joy and hope, replete with good sense and understanding of the ultimate causes. But these moments, these flashlights, were merely the premonitory signs of that last decisive second with which the seizure proper began. This second, indeed, was unbearable. He arrived at these conclusions: "What does it matter that this is disease, that it is abnormal tension, provided that the result, the instant of this sensation, appears to him who remembers it after the state of health is reestablished, as the climax of harmony and beauty, and lends to him a sensation, so far never anticipated, of completeness, symmetry, reconciliation and of enchanted, prayerful blending with the highest synthesis of life?" These were no dreamlike visions as are the consequence of indulging in hashish, opium or alcohol; unnatural, unsubstantial visions which depress the thinking faculty and damage the mind. When during that second, namely the last conscious moment before a seizure, sometimes he still was able to say:

"Yes, for this moment one could give the whole life!," then this moment was worth the whole life. In Moscow, where he often met Rogoshin, he once said to him: "In this moment that remarkable expression becomes clear to me, that there should be time no longer (Revelation x, 6). Probably," he had added with a smile, "that is the very second in which the water-jug, upset by the epileptic Mohamet, did not find time to run out while Mohamet in the same second saw all the habitations of Allah."

No physician, unless himself an epileptic, has ever described the onset of a seizure with such precision.

Another scene, an hour later: Drifting without purpose in the direction of the Petersburgskaja where Nastasja lived, and knowing that she would not be at home, "another dismal, tormenting curious feeling entranced him and drew him. A novel, sudden idea had come to him. "To think over his 'sudden idea' became immediately fearfully obnoxious to him and almost impossible. With painfully intensified attention, he regarded everything which entered into his view, the sky, the Newa. Perhaps also his epileptic condition was increasing more and more. The thunderstorm seemed, indeed, to gather, although slowly. At a distance it began to thunder, it grew very sultry." . . . With compulsion, he kept thinking of the murderer whom he had met some hours previously. He went into various reveries until he admonished himself: "Yet, what am I doing? It seems that I am mistaking something—how queer! My head is dizzy." And why had he presumed to judge those people? "Should Rogoshin indeed commit a murder, he will at least not do it in such a hideous manner!" . . . "A murderous tool ordered from a design and six men murdered in a complete delirium! Does Rogoshin own a murderous tool ordered from a design?—But—is it taken for granted that Rogoshin will commit a murder? Is it not a crime and baseness on my part to presume this with such cynic frankness?" He remained startled and as if nailed on the spot. All that had happened during his visit to Rogoshin went through his mind; but still he caught himself in seeking perpetually after something about his person; and then that shop, and the knife—what baseness! "Despair and sorrow seized his soul completely. He meant to return to his inn at once, actually turned around; but one minute later, he stopped again, turned and continued on his previous way. And now he was already in the Petersburgskaja and near the house; however, he did not go on 'with that particular idea,' how should that be possible! Yes, his idea had returned; there was no doubt about that; perhaps he would, today yet, have an attack. The pending attack was also the cause of all this darkness of soul and of that 'idea!' At present, the darkness was dissipated, the demon driven away; there was no doubt any more; in his heart reigned pure joy! And—such a long time he had not seen 'her;' he felt a need to see her again; and—this moment, he should wish to meet Rogoshin; he would take him by the hand and they would go there together.

"A burning, tormenting remembrance convulsed suddenly the heart of the prince. Yes, a tormenting remembrance! He recalled what a torture it had recently been for him when he noiced for the first time signs of at mental disorder upon her."

Finally, he arrived at the house, but did not find her in. When he left, again, "and very suddenly, a very great change had come over him; he had become pale and weak, was under a great excitement and walked like one severely suffering; his knees trembled, and a wan, lost smile played about his lips which had grown livid: his 'sudden idea' had become confirmed and proved correct, and again he believed in his demon!"

"What caused again this trembling, this cold perspiration, this darkness and chill in his soul? Was it because he had seen those 'eyes' again? But that had been the very object of his 'sudden idea.' He had felt an urgent desire to see again 'those eyes of before' and to determine whether he would meet them again there, near the house. Why, then, was he now so perturbed and depressed that he had really seen them just now? As if he had not expected it!" His imagination and hallucination are so vivid that he actually meets Rogoshin at the house, "and why had he not just now approached him, but had turned away from him, although their eyes had met each other's glance!" Tortured by his thoughts on the long walk returning from the house where he had been impulsively drawn to inquire for Nastasja, he accuses himself again, depressed by his hidden guilt, until he arrives in front of his inn. "But what *is* the matter with me? Indeed, today I believe, like a sick crone, in every presentiment!" Then, halting, he remembered suddenly again the knife which had been lying on Rogoshin's table, and, "stiff with astonishment, he remembered suddenly how he had stopped in front of the cutler's store. 'But what connection may there be?' he was going to say, but did not pronounce this thought to the end."

In the doorway it was now completely dark; the thundercloud, having swallowed the twilight, opened up the very moment the prince approached the house and poured down its rain. Suddenly he beheld, in the semi-dark of the passage, a man. This man appeared to wait for something, yet flitted swiftly away and disappeared . . . This man was surely Rogoshin. A moment after, he hurried after him, up the stairway. His heart stopped beating. "Now, all will be decided immediately," he said to himself with singular certainty.

Suddenly the two eyes, the very same eyes, met his glance. For a second the two men stood very close, face to face; suddenly the prince seized the other by the shoulders and turned him toward the stairway against the light: he wanted to see his face more distinctly. Rogoshin's eyes blazed forth, and an insane smile distorted his face. His right hand rushed upward, and some thing shone in it; it did not occur to the prince to stay the hand. He merely remembered later to have called out: "Parfen, I cannot believe it!"

"Then it seemed as if something suddenly opened up in front of him: an uncommon inner light illuminated his soul. This lasted perhaps half a second; yet the first sound of a frightful cry which broke forth spontaneously from his chest, and which he could not have witheld by any effort, he later clearly and consciously remembered. Then his consciousness became extinct, and complete darkness set in. He had been seized with an epileptic attack after this disease had not visited him such a long time.

As is well known, epileptic seizures happen very suddenly, particularly as the falling is concerned. The moment they begin, the features become distorted, and particularly the glance averted. Convulsions and spasmodic jerks seize all the facial muscles and the entire body. A frightful, indescribable cry which cannot be compared to anything, is wrung from the chest; in this outcry all that is human disappears, and for the observer it is impossible or at least very difficult to imagine and to believe that the one who cries is actually this man. One can even imagine that another is crying who exists inside this man.

At least many have thus described the impression received. With many the sight of a person seized by an epileptic attack produces an unbearable horror which may contain even something mystic. It is to be assumed that such a feeling of sudden horror made Rogoshin suddenly grow stiff on the spot and thus the prince was saved from the otherwise inevitable thrust of the raised knife. Then, when Rogoshin saw that the prince staggered and suddenly fell backward, aright down the stairs striking the back of his head with full force upon the stone step, he ran, almost insensible, out of the hotel."

Space will not allow to review the sad experiences of Nastasja, whom the prince had wanted to marry out of compassion. "Compassion," he says, "is the most important and, perhaps, the only law for the control of all human existence," an opinion which the philosopher Schopenhauer used to emphasize.

In the final chapter, Nastasja had asked Rogoshin (who had run away with her when the wedding night set by her, with the prince, had drawn a large gathering to the church at Pawslowsk) to take her to his house in Petersburg. There, Rogoshin kills her with the ominous knife the reader knows, and then goes to fetch the prince to spend the night with him in the very house. He went insane that night and later was sent to Siberia for fifteen years.

The prince, through the influence of a friend, was brought back to Dr. S's private institute in Switzerland. There the general's wife visited him with her two older daughters (Aglaja had, in the meantime, married an imposter). When she saw him in his sick and miserable state, she wept with all her heart. He did not even recognize her. The doctor (who had taken care of him years ago and knew him well) assured her that there was very little prospect for recovery and that his mind was completely shattered.

To analyze the case of Prince Myshkin ("The Idiot") of which my remarks have reproduced merely the main features pertaining to the epilepsy, would only be justified in order to satisfy those who have read the whole novel, because all the actors in this tragedy have a bearing on the prince's behavior and deserve consideration in order to explain his noble and superior character.

For the psychiater it will complete the picture to learn that the abnormal decision of Myshkin to marry Nastasja while he is betrothed to Aglaja can be accounted for by his suggestibility, helplessness in a critical situation (when the two women rivals meet), by his conscious motive resistless to a fanatic partiality to the modern woman and her rights, and by his instinctive desire to express his compassion for the woman who is perpetually hovering on the borderline of insanity. Nothing short of reading the whole book can reveal Nastasja's repeated episodical acts due to an acute frantic delirium, or the prince's occasional lofty irresponsibility.

Besides, the book contains numerous skilful sketches of psychotic symptomatology: the young man in the last stage of phthisis and his eccentricities; the person of Rogoshin, who finally murdered the woman whom he loved with a cynical passion; the several alcoholic neurotics; the apoplectic general (not Jepantchin), who had two strokes and died in one; I need only refer to these in order to convince the physician that this is a rare book for his leisure hours, almost expressly made for him, just as is Sinclair Lewis' "Arrowsmith," only in a different way.

In several of his other books, Dostoievsky introduces epileptics, but not quite with the enthusiasm which dictated his autobiographical descriptions in "The Idiot."

Interesting enough to quote is his delineation of Kiriloff, the hero of his "The Possessed," whom he has say of an aura: "There are moments, and they last only five or six seconds, when you feel suddenly the presence of universal harmony. During these moments, I live a whole human existence and I could give my whole life for it, and it would not be paying too dear."

Of his book "The Brothers Karamazov" Dostoievsky says: "A work that is very dear to me for I have put a great deal of my inmost self into it." It is saturated in mysticism, and by one critic designated as "a vade mecum of psychiatry."

The epileptic in this romance is Smerdyakov, the illegitimate son of the idiot girl whom Karamazov, the father, raped. To the description of his disease the author adds a masterly presentation of the personality alteration which so often accompanies its progress. In the same book he depicts in an unsurpassed manner the early manifestations of acute mania and the dual personality.

In his correspondence Dostoievsky writes: "You healthy young people don't suspect the happiness which we epileptics experience a second before a fit. Mohamet affirms in the Koran to have seen paradise, to have been there. Imbecile wiseacres pretend that he is an imposter and a knave. Nothing of the kind. He did not tell a falsehood, he certainly had seen paradise!" (From the French.)

FLAUBERT. The testimony regarding the French novelist Gustave Flaubert's (1821–1880) epilepsy is confirmed both by his contemporaries and his biographers, who have shown beyond any doubt that he had seizures from the time he was fifteen years old.[44]

Several Frenchmen, however, have disputed the question of his epilepsy, writing elaborate theses on the subject. The most profound one is by DeLastic.[45] Quoting Emile Faguet's "Les Écrivains français," the author says: (my translation) The characters described by Flaubert from life "are not types, properly speaking, but persons so vividly alive that one can recognize them." But nowhere, strangely, does Flaubert depict an epileptic. Emma, in "Madame Bovary," of the same psychopathic type as the author, is not an epileptic; at least that is my impression as well as that of Dr. P. Bailey[46] who says: "From a study of the mental disorders of the fictitious character, we get our truest conception of Flaubert's peculiar illnesses. Emma was no Epileptic. Neither, from the internal evidence, which is the best evidence we have, was Flaubert." He calls Flaubert's spells "epileptiform convulsions."

Pearce Bailey in a foot note, calls attention, remarking that Flaubert was born in Rouen in 1821 in the Charity Hospital, that another famous epileptic, Dostoievsky, also the son of a doctor as Flaubert, was born in a hospital in the same year. He quotes De Goncourt from his journal:

> Flaubert told us that when he was a child, he would become so immersed in his reading, with tongue pressed between his teeth and twisting a lock of hair with his fingers, that he would suddenly fall to the floor. Once he cut his nose in striking against a pane of glass . . . At the age of twenty-two, Flaubert had a number of convulsions, which were repeated on a few subsequent occasions, some at night.

The descriptions of Maxime du Camp, Flaubert's friend for many years, and those of the author himself, would seem to leave no doubt about the real condition:

> In the month of October 1843 he had been at Pontandemer. His brother, a physician, went for him. On a certain evening they started for home together in a buggy, Gustave driving. The night was dark; on the outskirts of Bourg-Achard, as a man pushing a cart passed the buggy on the left, and with the light from a lonely inn on the right, Gustave was overcome and fell . . . Other attacks followed, four in all, in the next two weeks . . . They always occurred in the same way and were also ushered in by the same symptoms. Suddenly, without apparent cause, Gustave would hold his head up and become very pale. He had felt the aura, that mysterious breath which passes over the countenance like the flight of a spirit. His face bore a look of anguish, and he would shrug his shoulders with a gesture of discouragement which was heart-breaking. He would say: "There is a flame in my right eye," and then after a few seconds, "There is a flame in my left eye; everything looks golden to me." This peculiar state lasted several minutes. And all this time it was plain to me he was hoping it would be nothing but an alarm. Then, his face blanching still further, would take on an expression of despair. He would walk rapidly up and down and run to his bed, throwing himself on it, depressed and gloomy, as though he were getting into a coffin. And then he would cry out, "I have the reins—there is the man pushing the cart—I hear his bell. Oh! I see the light of the inn." Then after a groan whose rending note still rings in my ears, he would pass into the convulsion. In it, his whole body shook, and after it he went into a deep sleep and was exhausted several days.

This is the description of one who was not a physician. Flaubert himself wrote:

> The trouble I had with my nerves, was the froth of my intellectual pleasantries. Each attack was like a kind of hemorrhage of the innervation; seminal losses of the pictorial faculty [picturesque powers according to another translator] of the brain, a hundred thousand images dancing together like fireworks. It was a brutal wrenching of mind from body (several times I thought I was dead), but that which constitutes personality, the thinking part of me [*l'être raisonable*] never let go. Without that, there would have been no suffering, for without that I should have been purely passive. As it was, I was always conscious, even when unable to speak. Then it was my mind bent on itself like a porcupine sticking itself with its own quills.

His doctors have left no records, surely none of them understood his case (P. Bailey).

Flaubert wrote a friend later:

> You asked how I cured myself of the nervous hallucinations I used to have. In two ways—first by studying them scientifically—that is, by trying to explain them to myself—and secondly, by force of will. I often felt myself going mad. My poor brain had a confused flock of ideas and images and it seemed that my consciousness, my I, was foundering like a ship in the storm. But I clung desperately to my reason, which though beaten and broken, triumphed. At other times, I would try in imagination to reproduce these horrible sufferings (indeed, in Madame Bovary). I played with madness and phantasy like Mithridates with his poisons. Pride sustained me, and I conquered the trouble by crushing it in a hand-to-hand struggle.

George M. Gould, in one of his "Biographic Clinics"[47] made a study of Flaubert from which I give the following highlights:

Nocturnal attacks were frequent, beginning in childhood, also swoonings, faintings and falling. The disease had no sudden onset. Flaubert read the books in his father's library on nervous diseases after he had returned from Paris to Rouen finding no taste in the study of law. Regarding Dumesnil's argument that Flaubert did not have "typical" epilepsy, Gould says:

> It is indeed the prototype of a very modern morbid habit among physicians of a certain mind, who cry "atypical" when the particular clinical feature cannot be made to fit into the nosologic puzzle. The more shrewd observer knows that with rare exceptions every case is individual; not even those called infectious and organic are indentical in their histories, and when it is a question of functional and psychic disease, all theories and typicalities end in thin air and ludicrousness. The epileptic seizure in many chronic cases is so uniform that the word typical has been applied to it, but even there, there are infinite variations chronicled, while in the early stages, the life-clinic, and the petit mal types of the disease, there are as many types as there are cases, and there are a thousand atypical examples to one that is properly and foolishly denominated "typical."

Quoting as significant from Flaubert's correspondence: "If I had had a sounder brain, I should not have made myself ill over reading law, and wearying myself. The vexation instead of staying in my head, passed into my limbs, and made them writhe with convulsions. It was a deviation," Gould says:

> In the last quotation we see an acuteness of observation and a soundness of judgment which no physician of that day could have equaled. There is a flashing glimpse into the physiology of epilepsy. If some of our modern epileptic specialists had either the desire or the ability to look at the disease in such a physiological and rational way, we would be much nearer a solution of the terrible problem. To the irritation of reading he ascribes the source of his ill—in a half-blind way, of course, and his *deviation* is a good statement of the explanation of the storm of derouted reflex irritation submerging the lower centers. Writing four years previously, he says that his "secret" was known to only one person who died "four years ago." There is no clinical explanation of all these facts, except upon the supposition that since the "earthquake" [meaning the epilepsy] of 1843, Flaubert was constantly under the influence of opium . . . It certainly throws a flood of light into a hundred puzzling mysteries, and solves many of the enigmas of his character, life and literary workmanship in a most gratify-

> ing manner. In one word, The Temptation of St. Anthony was a prolonged opium dream . . .

That "the dependance of suffering upon use of the eyes is capitally illustrated in Flaubert's case," Gould endeavors to prove by many quotations from Flaubert's correspondence. He then declares the error that "mental labor may produce suffering even with healthy eyes" an exploded theory. "In Flaubert's case the disproof is perfect, because he found his mind worked well and painlessly when he lay down and closed his eyes." It is a "capital example of inhibition," says Gould.

> He stamped and walked, howled, sang, and declaimed, like a madman day and night for thirty years to lash himself into a fury and overcome the inhibitious effects of eyestrain. He could lie down, close his eyes, and his brain would work vividly, and he could go on travels and his mind at once became a fireworks of abundant energy. But sit at his table and write—that he could not do.

George M. Gould summarizes:

> Flaubert from boyhood to the day of his death was the victim of unrecognized eyestrain. His epilepsy, typical or atypical, his "hysteroneurasthenia" (Dumesnil), his "migraine" (Brettonneau) or whatever name be given his symptoms, was the glaring consequence of abuse or overuse of slightly astigmatic or otherwise ametropic eyes. The mental and moral shock of the discovery led to the morbid seclusion, and unhygienic life, but every indication points to a control of epileptic tendency by means of opium.

NAPOLEON. The evidence in the literature of the alleged epilepsy of Napoleon Bonaparte seemed to me not sufficiently convincing to make out a good case; particularly the arguments regarding his hereditary disposition, which are not strong enough to be accepted as valid. Napoleon Bonaparte was born (1769) during the turbulent month of the conquest of Corsica by the French, his mother "Letizia having recently accompanied her husband in several journeys and escapes." Nothing more aggravating has been recorded, nor has in the lives of his three brothers and three sisters anything happened of medical interest which could not be considered normal for such a fecund family, which grew positively prolific in the next generation. Reading the arguments adduced by French writers in favor of interpreting the occasional vertigos experienced by Napoleon as epileptic equivalents, I feel justified in my assertion that the diagnosis has not been confirmed by a single frank *haut-mal* seizure. The only testimony in literature to a seizure by an eye witness does not prove the case.[28]

De Bourrienne, the private secretary of Napoleon, has this to say: "It has been repeated, over and over again, that Napoleon was subject to attacks of Epilepsy; but during the eleven years that I was almost constantly with him, I never observed any symptoms which in the least denoted that malady."[48]

L. Pierce Clark[49] endeavors to prove Napoleon's epilepsy by his defects of personality: egocentricity, supersensitiveness, disintegration of habits and character.

Speculating on the historic age of epilepsy, Karl Sudhoff ventures a hypothesis which deserves mention.[50] He refers to Neolithic skulls, dating back about 50,000 years, from which "so-called rondelled or sawed-out buttons, so far about fifty, have been found in the early Gallic graves. Some of them are perforated in one or two places or are provided with notches, suggesting the thought that these rounded bone plates were worn perhaps as protective amulets. Such round disks were also sawed out from the dead skull. It is probable that bony amulets were used as a prophylactic or curative agent in epilepsy and other convulsive disorders and in persistent headaches."

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   f. Koran. Sura III.
   g. Jebamoth. Babylon Gemara, 64, b.
   h. Kethuboth. Babylon Gemara, 77, a.
   i. Maimonides.
   j. 1 Samuel XIX, 24.
   k. P. 342.
   l. 1 Samuel XXIV, 22.
   m. II Samuel XXXI, 4.
   n. P. 358, referring to Herodotus 3:33.
8. Cf. Odyssey, VII, 104 and XX, 105.
9. DAREMBERG, C. V. La Médecine dans Homère. Paris, 1865.
10. DORLAND, W. A. N. The American Illustrated Medical Dictionary. Phila., W. B. Saunders Co., 1922.
11. GARRISON, F. H. An Introduction to the History of Medicine. Ed. 1, Phila., W. B. Saunders Co., 1914, p. 69.
12. The Genuine Works of Hippocrates. Trans. by Francis Adams. Lond., The Sydenham Soc., 1849, 2: 846.
   a. P. 847.
13. Goats were known by the ancients to suffer epileptic fits.
14. Mother of the gods, μήτηρ θεῶν, is Rhea, daughter of Uranos and Gaia, sister of Chronos and Okeanos.
15. Avicennae Canon. Venetiis, Peter Mauser and Co., 1484. The antique Latin and German books quoted can be found only in special libraries.
16. SPRENGEL, K. La Histoire de la Médecine. Paris, Deterville, 1815.
17. Artemisia; old German *wermuota*, i.e., anything that warms.
18. PARACELSUS, T. B. H. Philosophiae ad Athenienses, drey Bücher. Von ursachen und cura epilepsiae d. i. des Hinfallenden Siechtagen, Cöln, 1564.
   Etliche Tractaten: Von Podagra, Schlag, *Fallender Sucht*, Daubsucht, Kaltewehe Colica, Bauchreissen, Wassersucht, etc. Cöln, 1564.
   Pyrophilia vexation umque liber. Cui tres adhuc ejsd. autoris tractatus accessunt. Per D. ad a Bodenstein in ex autoris

archetypo germanico promulgato. Postmdum per G. Dorn in Latinum versi. Basiliae, Petr. Perna, 1568.

19. Alsarius a Cruce, V. De morbis capitis frequentioribus, quorum cognitio, et curatio ita traduntur, ut ad alios etiam cognoscendos, et curandos mirifice conducant, hoc est De catarrho, phrenitide lethargo et epilepsia seu comitiali morbo, libri septem. Romae, Gul. Facciottus, 1617.

20. Van Helmont, J. B. Doctrina inaudita de causis, modo fiendi lithiasis. De morbis lepra, caduco [epilepsy], apoplexia, etc. Venet., 1651.

21. Schröder, J. Quercetanus redivivus h.e. Ars medica dogmatico-hermetica ex scriptis Jos. Quercetani chymiatri digesta. 3 tomi in 1 vo.. Francoforte, Joa. Beyer, 1648. iii: A.M. Practica, vid. de peste, pleuritide, *epilepsia*, etc. Den schwedischen Feldherren Karl Gust. Wrangel und Gust. Horn und dem Joa. Oxenstirn gewidmet, dat. 23 März, 1648.

22. Petraeus, A. Curiose Gedancken von der Lüsternheit der schwangern Weiber und vom Brechen, D. Bernhard Albini von der Entzückung oder Hinfallung. Aus dem Lateinsischen übersetzet vom M. M. Dresden u. Leipzig, J. C. Meethen, 1701.

23. Strassburg, Balthasar Beck, mit 4 Holzschn., 1541.

24. Latin trans. by Georg Forbergium, Basileae, Petr. Pern., 1575, 112 pp.

25. Pariente, M. Paris Thèse. Paris, Ollier Henry, 1926.

26. New Hudson Shakespeare, Introduction to Julius Caesar. Pp. xi, xii.

27. Plutarch's Lives. Trans. by T. North. Lond., 1579.

28. Barois, R. Les Epileptiques de Génie. Par., Legrand, 1922.

29. Irving, W. Mohamet and His Successors. N. Y., G. P. Putnam's Sons, 1894. vol. 1, pp. 62 ff., see also bibliog. ref. 33.

30. Ibn Said reports in Arabic: "At the moment of inspiration, anxiety pressed upon the prophet, and his countenance was troubled. He fell to the ground like an inebriate, or one overcome by sleep; and in the coldest day his forehead would be bedewed with large drops of perspiration. Even his she-camel, if he chanced to become inspired while mounted on her, would be affected by a wild excitement . . . To outward appearance inspiration descended unexpectedly, and without any previous warning to the prophet. When questioned on the subject he replied: 'Sometimes Gabriel communicateth the Revelation to me as one man to another; at other times, it is like the ringing of a bell, penetrating my very heart, and rending me; and this it is which afflicts me the most.'"

31. Pelman, K. Psychische Grenzzustände. Bonn, 1909. P. 262.

32. To give the reader an opportunity to form an independent opinion I quote a few passages representing the translations from the Arabic texts of scholars contemporary with Mohammad[33] (the different ways of spelling the name are due to the different sources of the originals, the Arabic script using only consonants, not vowels). From Suras xviii, 5, and xxvi, 2 we learn that "Mohammad went out now to one mountain, and then to another, seeking to cast himself headlong thence," Quoted by Al-Wakidi: "Over and again he meditated suicide.". . . "Having expected Gabriel, the Messenger of God, to appear, he was greatly downcast because the angel did not appear to him."

Again: "He meditated suicide; but as he rushed forth with the intention of casting himself down a precipice, he was arrested by the appearance of Gabriel, and stood for a long time transfixed by the sight." Ibn Hishām.

In only one place, the authors state: "Nor must we forget the excitement and agitation (possibly of an *epileptic character*) which occasionally overpowered him in the moments of supposed inspiration and intercourse with his unseen visitants."[33]

Among the "inconsistencies" of Mohamet's character, the authors mention: "self-sacrificing offices of love and friendship, yet he could gloat over the massacre of an entire tribe, and savagely consign an innocent babe to the fires of hell."

Regarding his death, they write, describing the fever which reached its climax at the end of two weeks: "Restless and apparently delirious, he kept now drawing the bed-clothes up over his face, now casting them off again; and in the excitement and perhaps wanderings of the moment, cried out: 'The Lord destroy the Jews and Christians! Let his anger be kindled against those that turn the tombs of their prophets into places of worship.'" Then every one of his dying days for the last week is described.

33. Muir, Sir W. The Life of Mohammed. From original sources. Rev. Ed. by T. H. Weir. Edinb., John Grant, 1923.
34. Seeligmüller, A. War Paulus Epileptiker? Erwägungen eines Nervenarztes. Leipz., J. C. Hinrich, 1910.
35. Krenkel, M. Beiträge zur Aufhellung der Geschichte und der Briefe des Apostels Paulus. iv. Der Dorn im Fleisch. Ed. 2, Braunschweig, 1895.
36. Baur, F. C. Paulus, der Apostel Jesu Christi. Stuttgart, Becher & Müller, 1845.
37. Acts xviii, 18.
38. Acta Pauli et Theclae (acta apostolorum apocrypha post. Const.) Tischendorf denuo edid. R. A. Lipsius et M. Bonnet, Paris prior Lips. 1891.
39. Halmel, A. Der zweite Korintherbrief des Apostels Paulus. Halle a. S., Max Niemeyer, 1904. This author, also quoted by Seeligmüller, states: "Krenkel's investigations suffer severely of an infirmity of method, which alone marks them in their entirety as a most contradictory figment."
40. Acts, xxvii.
41. Grandgent, C. H. Dante and St. Paul. *Romania*, Paris, 1902.
42. ii Corinthians, xii.
43. Acts, ix, 9.
44. Talleyrand. Mémoires, Vol. i: 295.
45. DeLastic. La Pathologie Mentale de les Oeuvres de Gustave Flaubert. Paris, Baillière et Fils, 1906.
46. Bailey, P. Flaubert's Epilepsy. The Proceedings of the Charaka Club. Vol. 3. N. Y., Wm. Wood & Co., 1910.
47. Gould, G. M. Biographic Clinics, Vol. 4. Phila. P. Blakiston's Son & Co., 1906.
48. De Bourrienne. Memoirs of Napoleon. i: 309.
49 Clark, L. P. A Psycho-historical study of the epileptic personality in the genius. *Psychoanalyt. Rev.*, 9: No. 4, Oct., 1922.
50. Sudhoff, K. Essays in the History of Medicine edited by F. H. Garrison. Medical Life Press, 1926.

[From Schenckius: Observatonum Medicarum, Francofurti, 1609.]

EDITORIAL

SIR CHRISTOPHER WREN ANATOMIST

THERE has lately been installed in the Old Ashmolean Museum at Oxford a memorial window designed to commemorate the men of science who were connected with its foundation. One of its lights bearing the arms and instruments of Sir Christopher Wren was presented by the Royal Institute of British Architects. As one would expect the instruments shown are all connected with that profession and do not symbolize the other branches of science in which he at one time showed such proficiency.

No more appropriate place for such a window could have been found. The Old Ashmolean Museum was built between 1679 and 1682 to house the collection of rarities, including those of Tradescant, which Elias Ashmole presented to the University of Oxford. Gunther[1] has proved that Wren was the architect, a fact upon which some doubts had been thrown. Besides the Museum it contained lecture rooms and laboratories, a library and a dissecting room for private courses on anatomy. The first keeper of the Ashmolean Museum was Dr. Robert Plot, the author of the "Natural History of Oxfordshire," who is also commemorated by one of the lights in the memorial window. He was closely associated with both Ashmole and Wren, serving as Ashmolean Professor of Chemistry at Oxford and from 1682 to 1684 as Secretary of the Royal Society. For many years the Ashmolean Museum with its collections, which were constantly added to, its laboratories and library, was the center of scientific research at Oxford. At the present time its collections have been removed either to the New Ashmolean Museum or to the Museum in the Park. It houses, however, the invaluable Lewis Evans Collection of Scientific Instruments, containing one of the most perfect collections of mathematical astronomical and optical instruments in the world. With a library of works bearing on the subjects illustrated by the collection it is an invaluable workshop and as such is utilized. Scattered throughout various collections, in the Bodleian, the Natural History Museum, the New Ashmolean Museum, may be seen "rarities," such as Powhattan's shirt, tusks of Narwhales and elephants, etc., transplanted from their former habitation, but we doubt whether a mind like Wren's would not be better pleased to see the transformation of the Museum he built to its present purposes rather than overcrowded with

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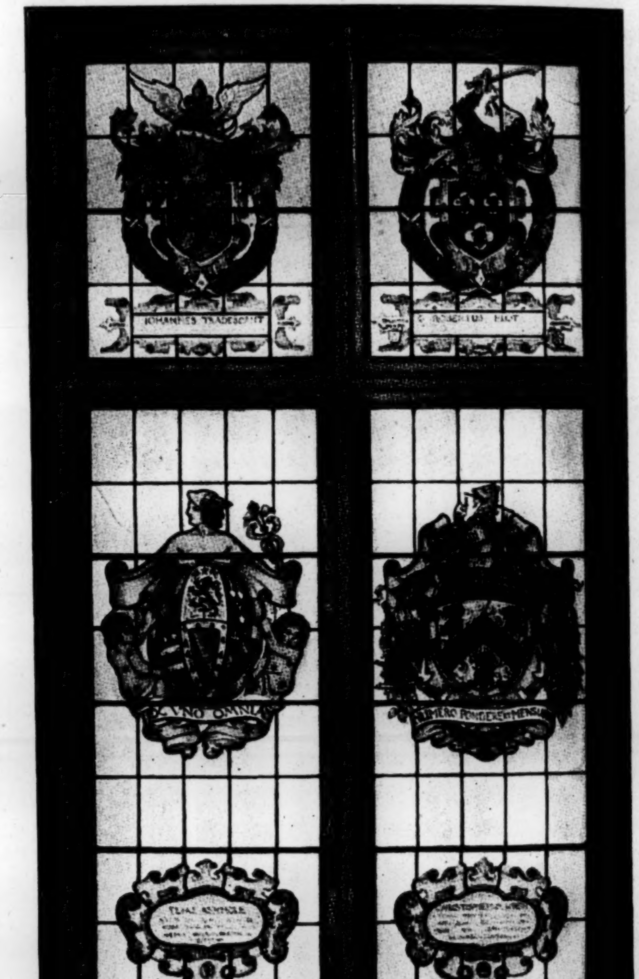
[1] Gunther, R. T. Early Science at Oxford, Oxford Univ. Press, 1925, vol. 3.



THE WREN-ASHMOLE WINDOW AT OXFORD.

Designed to commemorate the Men of Science who were connected with the Foundation of the old Ashmolean Museum. The lower light with the arms and instruments of Sir Christopher Wren is being presented to Oxford by the Royal Institute of British Architects.

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the useless "rarities" with which it was once stocked. The present curator, R. T. Gunther, has certainly reason to be proud of the working value of the Museum under his care.

Of the group of distinguished men who did so much for the advancement of science at Oxford and in London during the middle and later part of the sixteenth century there was one whose name is chiefly remembered for his architectural achievements and but little recalled for his eminence as an astronomer and in the natural sciences, particularly that of anatomy.

Christopher Wren, the son of a well-known clergyman, was born October 20, 1632 and at an early age manifested the great intellectual capacity by which he later won such distinction. Upon leaving Westminster School at the age of fourteen, he became assistant to Dr. Charles Scarburgh, the anatomist, who was held in such esteem by William Harvey that he chose him for his successor in the Lumleian Lectureship and bequeathed him his surgical instruments in his will. Scarburgh delivered the anatomy lectures at the Barber-Surgeons' Hall and Wren's duties were to assist him in making anatomical preparations and in his demonstrations. While thus engaged Wren undertook the very different task of translating William Oughtred's work on geometrical dialling into Latin. In 1646 he became a Fellow-Commoner at Wadham College, Oxford and thereafter was closely associated for many years with the men who later became the founders of the Royal Society. This group included John Wallis, the mathematician, Dr., later Sir William Petty, who is chiefly remembered for his monumental "Survey of Ireland," but who began his career as a physician and anatomist; Robert Boyle, the chemist, and Thomas Willis and Richard Lower, the anatomists. It is not our purpose to refer at length to Wren's work in other fields than those which pertain to medical science but as evidence of the immense range of his intellectual activity we may recall that when but twenty-five years old he was appointed Professor of Astronomy in Gresham College, London, and three years later was elected Savilian Professor of Astronomy at Oxford. In 1661 he received the degree of D.C.L. at Oxford and of LL.D. from Cambridge. His researches on mathematics and astronomy were numerous and of permanent value and he took a great part in the chemical and physical researches of his intimate friend, Robert Boyle.

As we have stated above Wren had had an excellent training in anatomy before he came to Oxford. The subject continued to interest him. When Thomas Willis brought out his famous work on the anatomy of the nervous system, "Cerebri Anatome cui accesset Nervorumque descriptio et usus," in 1664, the success of the work, as Gunther states, "was in large measure due to the elaborate anatomical drawings of Christopher Wren." One has only to look at the figures and plates in Willis's book to justify this remark. They show very plainly that they were the work not only of a talented artist but also of a skilled anatomist.

F. J. Cole[1] in his exhaustive study of the injection of the vessels for anatomical study shows that injections into the vessels of living animals for physiological study and into dead ones for anatomical purposes were practiced by many of the older anatomists. He refers particularly to the work of Berengarius (1521), Massa (1536) Jacques Dubois, or Sylvius (1555), Lusitanus (1556) and Eustachius. Cole thinks that the statement of Michele Medici that Alessandra Giliani, who died in 1326, filled the vessels with colored fluids which hardened after injection, lacks confirmation. From the above it can be seen that the often made statement that Wren was the inventor of anatomical injections is not correct. It is based on the fact that sometime before 1659 Wren suggested to Boyle to ligate the veins of a living animal, open them on the side of the ligature nearest the heart, and inject them:

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[1] Cole, F. J. The History of Anatomical Injections. In: Singer's Studies in the History of Science. Oxford, 1921, vol. 2.

> And they hope likewise that beside the *medical* uses, that may be made of this *invention*, it may also serve for anatomical purposes, by filling after this way, the vessels of an animal as full as they can hold, and by exceedingly distending them, discover new vessels . . . To Oxford, and in it, to Dr. Christopher Wren, this invention is due.

Wren had previously made dogs drunk by injecting wine and ale into the venous circulation. Cole points out that to Boyle himself is due "the first unequivocal mention of solidifying injection media, and it is noteworthy that two of them, plaster and gelatin, are in use at the present day." Wren did devise a method whereby blood could be successfully transfused from one living animal to another, and he also removed the spleen from living dogs without causing the death of the animal.

Gunther[1] quotes from Plot's "Natural History of Oxfordshire," 1677, the following statement:

> The learned and ingenious Sir Christopher Wren . . . was the first author of that noble experiment of injecting liquors into the veins of animals, first exhibited to the meetings at Oxford, about the year 1656, and then carried by some Germans and published abroad; by which operation divers animals were at once purged, vomited, intoxicated, kill'd or revived, according to the quality of the liquor injected (Hist. R. Soc.), whereof we have several instances in our Phil. Trans. of 4 Dec. 1665. From whence arose many other new experiments.

These transfusion experiments were taken up with the greatest enthusiasm in France and England, and the reports of the rejuvenation of old dogs and sheep and in some instances of old men remind one forcibly of the announcements we now hear of similar results from the transplantation of certain glands. After a short time in which failures and mishaps began to manifest themselves the French government deemed it necessary to forbid the performance of the operation on human subjects.

Wren was an ardent zoologist, studying the structure and habits of animals and their embryological development. He was one of the earliest microscopists. Robert Hooke wrote that when urged by Dr. Wilkins to engage in microscopical observations he did so:

> . . . with much reluctancy, because I was to follow in the footsteps of so eminent a person as Dr. Wren, who was the first that attempted anything of this nature; whose original draughts do now make one of the Ornaments of that great collection of Rarities in the King's

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[1] *Op. cit.*, p. 130.

> Closet . . . But at last being assured both by Dr. Wilkins and Dr. Wren himself that he had given over his intentions of prosecuting it, and not finding that there was any else design'd the pursuing of it, I set out upon this undertaking.

This undertaking was that great series of microscopical researches which has preserved the name of Hooke as one of the foremost microscopists.

Wren was one of the most prominent among the founders of the Royal Society and a constant attendant at its meetings and participant in its discussions. For two years he served as president.

Unfortunately for natural science this great investigator withdrew from its service at a comparatively early age to devote himself to the profession of architecture, in which he soon became famous. With this the most brilliant part of his career we are not particularly concerned. We might mention that in 1689 he was the architect of the hall of the Royal College of Physicians in Warwick Lane, which it occupied until 1825 when it moved into its present hall in Pall Mall.

In 1661, when twenty-eight years old, Charles II appointed Wren Assistant Surveyor-General to his Majesty's works, and soon Wren's time became so fully occupied with architectural matters, particularly after the Great Fire of London in 1666, that he was obliged to abandon his scientific pursuits in other fields. Nevertheless as we have seen, he maintained his interest in the affairs of the Royal Society. He lived to be ninety years old, dying on February 25, 1723: He lies buried in one of the aisles of St. Paul's Cathedral, perhaps his most famous architectural creation.

BOOK REVIEWS

Four Centuries of Medical History in Canada, and a Sketch of the Medical History of Newfoundland. By John J. Heagerty, M.D., D.P.H. Preface by A. S. Doughty, C.M.G., F.R.S.C. 2 vols. Univ. Chicago Press, 1928.

The early medical history of Canada is more fully recorded than that of most recently discovered lands. Beginning with records of Cartier's voyage, it is continued by the Jesuit Relations, and the reports of the French intendants and governors, down to the period when Canada became a British possession, after which there is a great store of information supplied by material left by the numerous physicians who came out to settle in the new colony.

Part I of the first volume is a valuable account of the various epidemic diseases from which Canada has suffered. It begins with scurvy which wrought terrible devastation in the ranks of the early settlers. In 1535 the Indians told Cartier their remedy for it, a decoction of the bark and leaves of the spruce tree; and he used it for his men with wonderful results. Nevertheless, the disease continued to ravage the early settlements for many years. In 1606 Champlain records the death of many French settlers at St. Croix, and incidently mentions what were probably the first recorded autopsies performed on the Continent of North America: "Our surgeon named des Champs of Honfleur, a man expert in his art, opened some of the bodies to see if he might better recognize the cause of the disease, which had not been done the preceding year." The disease continued to prevail, especially among the soldiers in various garrisons, down to nearly the close of the eighteenth century.

Smallpox was widely prevalent among the Indians as well as the settlers, and the mortality from it was very high. The Indians believed that the Jesuit missionaries had purposely introduced it among them, and on a number of occasions attempted to avenge themselves. Dreadful epidemic attacks continually recurred until the introduction of vaccination. In 1807 Edward Jenner sent to the Chief of the Five Nations a copy of the book issued by the Royal Jennerian Society, in which instructions are given in vaccinating. Dr. Heagerty reproduces the fly-leaf in facsimile, bearing an inscription from Jenner to the Chief.

Yellow fever, which the French called "Mal de Siam" was epidemic in Canada at least once. In 1710 it was brought to Quebec by a French vessel from the West Indies. Heagerty does not consider it proved that yellow fever ever appeared epidemically, subsequent to that outbreak, although statements to the contrary have been made; nor does he consider it proved that bubonic plague was ever epidemic in Canada. In discussing the epidemics of "ship fever" which were introduced into Canada chiefly by immigrant ships, Dr. Heagerty, while believing that in most instances the disease was typhus fever, thinks that in some it was undoubtedly yellow fever. In 1847 there was an appalling epidemic of this nature in which there died at sea, on the way out to Canada, 5293 persons, and at the quarantine station at Grosse Isle, and in Quebec and Montreal, 15,072, a total of 20,365, out of between eighty and ninety thousand immigrants.

A curious disease which occurred among the inhabitants of Mal Baie, and was called "Mal de Mal Baie" or "St. Paul's Bay Disease," first excited the attention of the Government in 1773. Dr. Heagerty describes the symptoms of the disease, and the measures taken to control the epidemic form in which it prevailed, and concludes that it was a severe form of syphilis, and that in many cases the abuse of mercury, the only remedy which in any way seemed to control it, by lay and ignorant practitioners, aggravated the patients' condition. It was brought under control about 1786.

Leprosy was first officially recognised in Canada in 1815, and for many years there were many cases, especially in New Brunswick. It has now become a very rare disease, and is completely controlled.

In 1832 a terrible epidemic of cholera occurred in Canada simultaneously with its prevalence in England, France and other Continental countries. In spite of precautions taken at an early date by the port authorities, the disease was imported into Quebec by an immigrant ship in June, 1832, and prevailed until September. The disease spread rapidly from Quebec to Montreal and other inland places. Other severe epidemics occurred in 1834, 1849, 1852 and 1854, but were not so terrible as the first.

An interesting section of the book is devoted to the pioneer physicians of the colony, many of whom were outstanding characters who exerted great influence in their communities, and as in other new countries, took a prominent part in public affairs.

The oldest hospital in Canada is the Hôtel-Dieu of Quebec, which was founded in 1639, and is only antedated in North and South America by the Hospital of the Immaculate Conception, established in the city of Mexico in 1524. The Hôtel Dieu of Quebec was established through the generosity of the Duchess d'Aiguillon, a niece of Cardinal Richelieu, who furnished the funds necessary to send out some nuns from Les Religieuses Hospitallières de Dieppe, to take charge of the work; and provided an annual sum for the maintenance of the hospital, for which she had previously procured a grant of land for the site.

On their arrival at Quebec, all the inhabitants turned out to greet the self-sacrificing women, whose noble work has been carried on with such benefit to the community to the present day. The Author gives a vivid recital of the perils and hardships the Sisters underwent during their years in what was practically a frontier town.

In 1644 the Hôtel-Dieu of Montreal was opened by the celebrated Mlle. Mance, who continued to manage its affairs until her death in 1673. At one time, six years after its establishment, it had to be abandoned because of an attack by Indians, but when they had been driven away, the indomitable woman returned to her charge with redoubled energy.

It was not until 1822 that any effort towards establishing organized medical teaching was attempted in Canada. In that year, Dr. Stephenson began giving courses of lectures at the Montreal General Hospital, and two years later established the Montreal Medical Institute, which was the precursor of the McGill Medical School. Many medical schools sprang into existence in the years following, of which that of the University of Toronto (1857), and of McGill (1832), rank among the foremost medical colleges in North America.

The first Canadian medical journal was the *Journal de Medecine de Quebec*, which was founded in 1826 by Dr. Xavier Tessier. It was published in both French and English; the latter section being entitled the "Quebec Medical Journal."

In 1836, the Quebec Medical Society, the first organization of its kind in Canada, was founded with Dr. Joseph Morrin as its initial president.

Dr. Heagerty's large work covers much more than the above excerpts from its contents would indicate. It deals at length with all the various phases of public health service, nursing, tuberculosis, the services of the medical profession in the army, and the Canadian Red Cross. He has done a great service not only to the profession, but also, as Mr. Doughty points out in his preface, to lay readers, on whom the profound importance of the relation of medical history to the general history of a country is too seldom impressed. The book is delightfully written, well illustrated and indexed. It is not only essential for reference, but a pleasure to read.

FRANCIS R. PACKARD.

OLD MASTERPIECES IN SURGERY, BEING A COLLECTION OF THOUGHTS AND OBSERVATIONS ENGENDERED BY A PERUSAL OF SOME OF THE WORKS OF OUR FOREBEARS IN SURGERY. By Alfred Brown, M.D. Omaha, Nebraska, 1928. Privately printed.

It was a happy inspiration which led to the publication of the series of articles herewith reprinted in *Surgery, Gynecology and Obstetrics*, and it is gratifying to have them collected in a volume. In a very modestly worded preface Dr. Brown disclaims any attempt to pose as an original worker in source material. Nevertheless he has reproduced from what are practically, and in many instances actually, original sources, the gist of what is of permanent value and interest in the writings of the ancient masters of surgery, including midwifery and gynecology. He has chosen for this purpose nearly fifty subjects, beginning with Sorahus of Ephesus, Oribasius, Alexander of Tralles and Paul of Aegina, continuing through the medieval period with Roger and Roland and their contemporaries of followers, the surgeries of Brunschwig and von Gerssdorff, and the obstetric manuals such as the "Rosegarden for Pregnant and Midwives," the "Birth of Mankynde," and the obstetric manual of Rueff. All the great surgeons of the fifteenth and sixteenth century, including Tagault and Franco as well as the more familiar names of Paracelsus and Paré, are represented by brief summaries of what they actually did to further the science of surgery. The last two articles deal with Cheselden and Pierre Dionis. Every article is accompanied by one or more appropriate illustrations drawn from standard editions of the various works. Dr. Brown has the happy faculty of presenting the gist of what is valuable in the writings of the old worthies of surgery and his briefly written expositions cannot be too highly commended.

The book is most artistically got up both typographically and in the matter of illustrations. It is a pity that it should not be regularly published in order that so charming a volume might be rendered available to the constantly increasing number of those interested in medical history. As a gift book for a doctor or student of medicine we know few volumes which would be more generally acceptable.

FRANCIS R. PACKARD. M.D.

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